THE JOURNAL OF GAS LIGHTING
WATER SUPPLY & SANITARY IMPROVEMENT

VOL. LVI. No. 1423.] LONDON, AUGUST 19, 1890. [42ND YEAR. Price 6d.

WOLSTON'S Paste and Ready Mixed for Use.

Guaranteed Free from Adulteration. **TORBAY PAINTS.**

FOR GASHOLDERS, &c., &c.

The Original "Torbay Paints"

As supplied during many years to the LONDON GASLIGHT & COKE COMPANY.

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TORBAY & DART PAINT Co., Ld.,
23, Gt. George St., Westminster, S.W.
DARTMOUTH, & BRIXHAM (TORBAY).

— ESTABLISHED 1830. —
PARKER & LESTER,
Manufacturers & Contractors.

THE ONLY MAKERS OF
PATENT ANTIMONY PAINT,
Parker's Imperial Black Varnish,
Oxide Paints, Oils, and General Stores for Gas and Water Works.

WORKS:
ORMSIDE STREET, OLD KENT ROAD, LONDON.

Ashmore, Benson, Pease, & Co., Ld.,
STOCKTON-ON-TEES,
Manufacturing Gas Engineers.
See Advertisement, p. 427.

CEMENT
EARLE'S
BEST
Portland Cement
MANUFACTURED BY
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STOREAGE CAPACITY 10,000 Tons.

ESTABLISHED 1811—OVER THREE QUARTERS OF A CENTURY.
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Manufacturers & Patentees of every Description of
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FOR
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WHOLESALE DEPOT: 52, COMMERCIAL ST., LONDON, E.

We specially solicit Government and Local Board Contracts for General Lighting.

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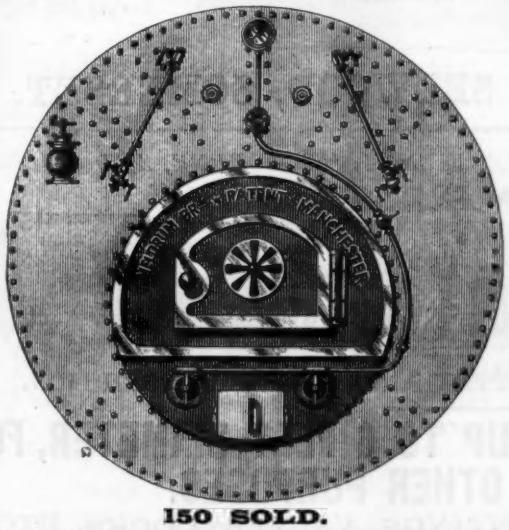

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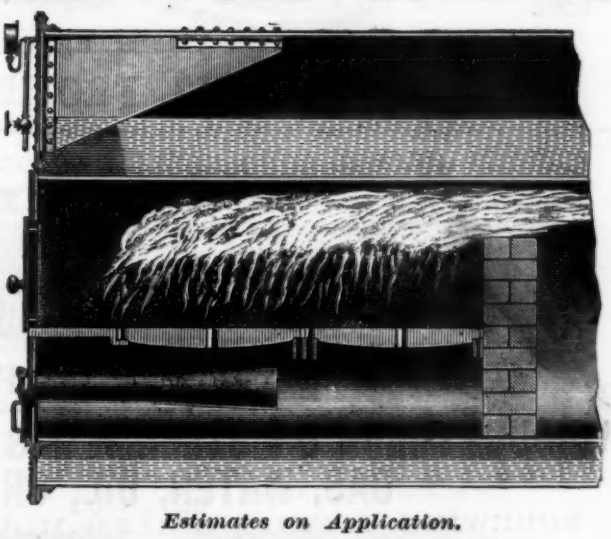


Estimates on Application.

MELDRUM BROS.,
26, HALF STREET, CATHEDRAL YARD, MANCHESTER.

DANIEL HOWARD,

(Successor to the late BENJ. WHITEHOUSE),

GASHOLDER & BOILER WORKS,

WEST BROMWICH, NEAR BIRMINGHAM

(ESTABLISHED 1765),

MANUFACTURER OF TELESCOPIC AND SINGLE GASHOLDERS,

WROUGHT AND CAST IRON TANKS FOR DITTO,

PURIFIERS, CONDENSERS, SCRUBBERS, HYDRAULIC MAINS, and all kinds of GAS APPARATUS,

Wrought-Iron Roofs, Bridges, Girders, &c.,

Steam, Hot Water, and Range Boilers, Tanks, Cisterns, Boats, and all kinds of Wrought-Iron Work.

DRAWINGS, SPECIFICATIONS, AND ESTIMATES SUPPLIED ON APPLICATION.

TELEGRAPHIC ADDRESS: "COCKEY'S FROME."

EDWARD COCKEY & SONS, Ld.,

ESTABLISHED OVER HALF A CENTURY.

Gas Engineers and Contractors for the Erection of Gas-Works.

MANUFACTURERS OF IMPROVED GAS-EXHAUSTING APPARATUS.

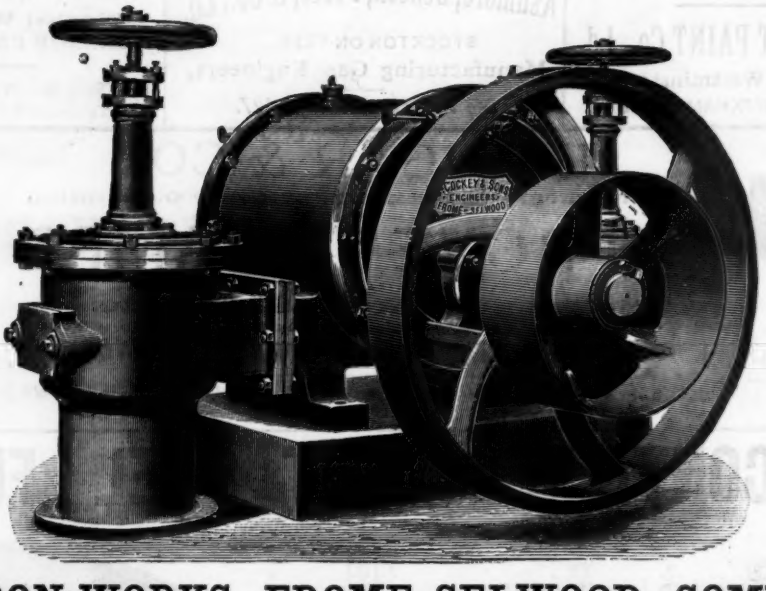
A Large Stock of Valves always on hand.

Lamp Columns; various patterns.

Wood Grids for Purifiers and Scrubbers.

Castings of every description.

Apparatus for the manufacture of Sulphate of Ammonia.



Experienced Retort-Setters constantly employed.

Lead Burning and Plumbing in all its Branches.

Gas-Fittings in great variety.

Brass Castings.

Patent Washers and Valves.

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THE IRON-WORKS, FROME SELWOOD, SOMERSET.

HIGHEST AWARDS—LONDON, PARIS, COLOGNE, VIENNA, MELBOURNE, AND OTHERS.

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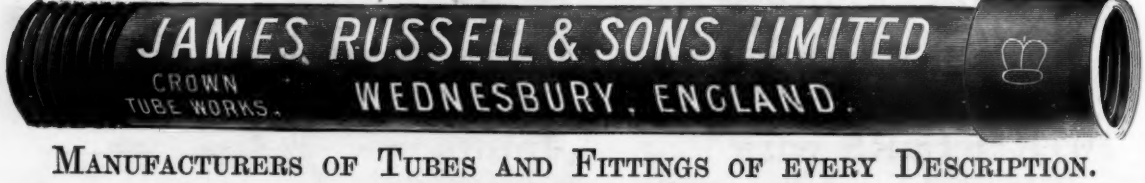

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WROUGHT-IRON OR STEEL MAINS UP TO 6 FEET DIAMETER, FOR GAS, WATER, OIL, OR OTHER PURPOSES.

SCREWING TACKLE, BOILER MOUNTINGS, VALVES, COCKS, ETC.

LONDON: 108, Southwark Street. BIRMINGHAM: 114, Colmore Row. LEEDS: 6, Mark Lane, New Briggate.

THOMAS PIGGOTT & CO.,

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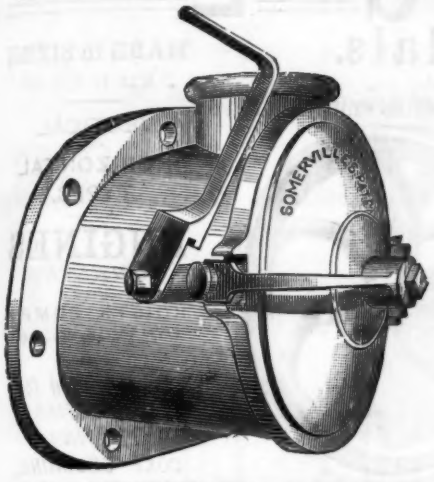

GASHOLDERS AND GAS APPARATUS,

INCLUDING

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GASHOLDER TANKS IN CAST AND WROUGHT IRON;

GOLIATH, HYDRAULIC, AND OTHER PURIFIER COVER LIFTS,

ALL OF THE MOST APPROVED DESIGNS.

BOILERS, ENGINES, PUMPS, EXHAUSTERS, METERS, GOVERNORS, &c.

SULPHATE OF AMMONIA PLANT.

MAKERS OF

SOMERVILLE'S PATENT RETORT MOUTHPIECES & LIDS,

WHICH ARE SELF-SEALING AND REQUIRE NO LUTING.

Prices and further Particulars may be obtained on application.

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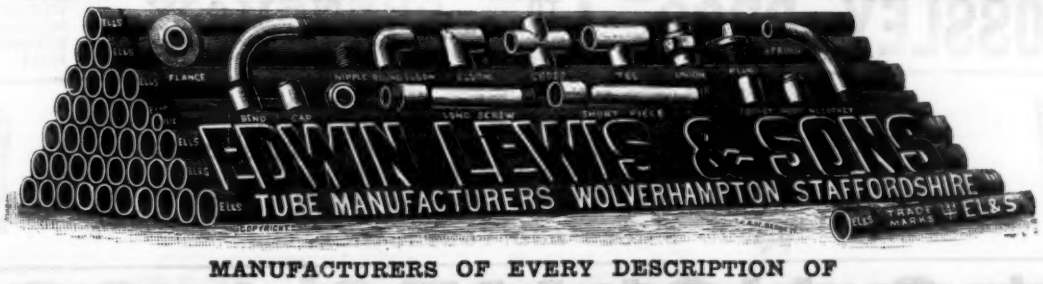

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FOR ANY PURPOSE.

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MANUFACTURERS OF

SLIDE VALVES,
WITH RACK & PINION,
OR
Internal or External
SCREWS, of all Sizes.

GASHOLDERS,
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Gasholder Tanks.

CAST-IRON RETORTS,
RETORT-BED FITTINGS,
And Retort-House Appliances
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Iron Roofs, Columns, Girders, Floor Plates and Tools, &c.

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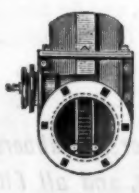
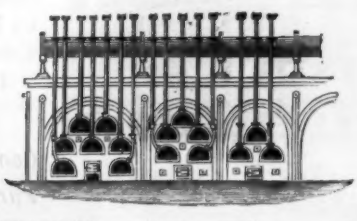
CONDENSERS,
SCRUBBERS, & WASHERS,
TAR AND LIQUOR PUMPS, &c.

PATENT
CENTRE VALVES
for working Purifiers.
Also Bye-Pass & Stop Valves.





PURIFIERS with Planed Joints,
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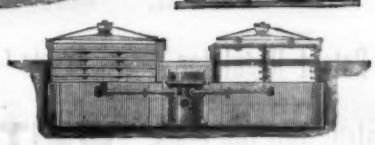
CAST AND WROUGHT IRON TANKS AND CISTERNS.



DESIGNS, SPECIFICATIONS, AND ESTIMATES FREE.

Pig Iron (*Special Quality*) for ENGINE CYLINDERS, &c.

GAS COAL FAMOUS FOR ITS UNRIVALLED EXCELLENCE.

CROSSLEY'S "OTTO" GAS-ENGINE.

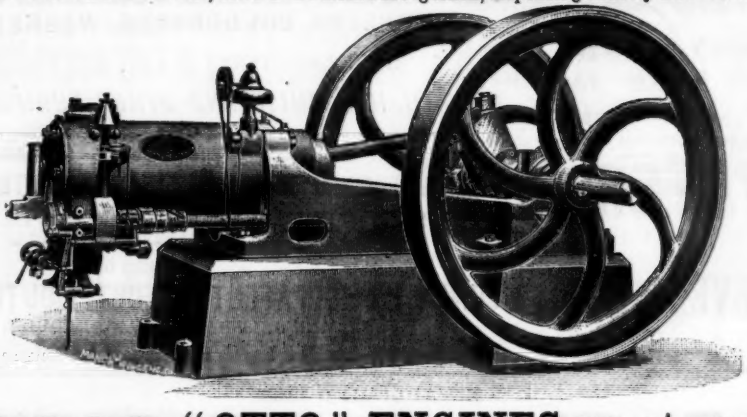
100 Prize Medals.

MADE in SIZES
2-Man to 100-HP.

GAS-ENGINES
COMBINED
WITH
PUMPS
FOR
TOWNS SUPPLY
SEWAGE, &c., &c.

GAS-ENGINES
COMBINED
WITH
AIR COMPRESSORS
FOR THE
SHONE SEWAGE
SYSTEM, LUCIGEN
LIGHT, &c.

New 14-H.P. Nominal Size, fitted with Patent Tube Ignition, dispensing entirely with Plates.



MADE in SIZES
2-Man to 100-HP.

VERTICAL
AND
HORIZONTAL
TYPES.

ENGINES
COMBINED
WITH
HOISTS, PUMPS,
DYNAMOS, &c., &c.

Largely used for
EXHAUSTING,
PUMPING,
COKE CRUSHING,
ELECTRIC LIGHTING,
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Over 31,000 "OTTO" ENGINES are at work.

CROSSLEY BROS., LTD., OPENSHAW, MANCHESTER,

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NEWCASTLE,
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HARRIS & PEARSON,
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MANUFACTURERS OF
FIRE-CLAY GAS-RETORTS, FIRE-BRICKS, LUMPS, & TILES of Every Description.
GLAZED BRICKS AND PORCELAIN BATHS.

W. C. HOLMES & CO.,
CONTRACTING GAS ENGINEERS.

SPECIALITIES.

Patent Regenerative Retort-Settings.

Patent Rotary Scrubber-Washer.

Patent Reciprocating Exhauster.

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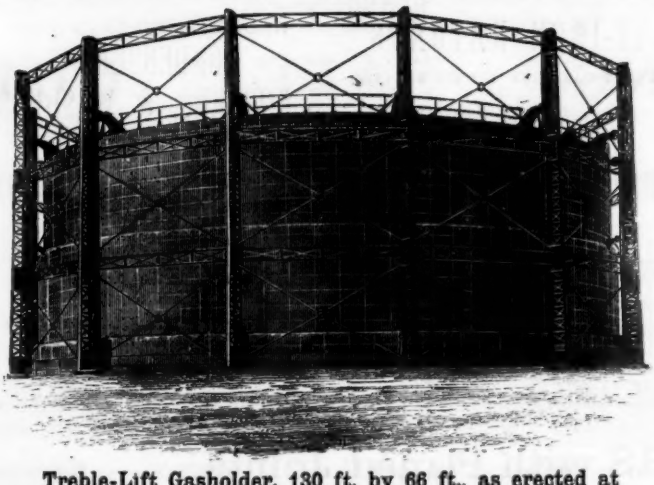
Patent Anti-Dip Pipes.



Treble-Lift Gasholder, 130 ft. by 66 ft., as erected at Burton-on-Trent, 1889.

SOLE MAKERS OF
DRAKE'S
PATENT
GAS PLANT
Specially adapted for Country Places, and for mixing with Coal Gas to increase Illuminating Power.

Condensers, Scrubbers, Purifiers, and all Fittings for Gas-Works.

IMPROVED
CHEMICAL PLANT.

WHITESTONE IRON-WORKS,
HUDDERSFIELD,
AND
80, CANNON STREET, LONDON, E.C.

Telegrams:
"Holmes Huddersfield."
"Ignitor London."

Illustrated Catalogues on application.

JOHN HALL & CO.,

STOURBRIDGE,

MANUFACTURERS OF FIRE-BRICKS, LUMPS, TILES,

AND EVERY DESCRIPTION OF FIRE-CLAY GOODS.

RETORTS CAREFULLY PACKED FOR SHIPMENT.

A STOCK OF DIFFERENT SHAPES ON HAND.

GAS AND WATER PIPES

AND

CASTINGS OF EVERY DESCRIPTION.

MANUFACTURED BY THE

CLAY CROSS COMPANY,

CHESTERFIELD.

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MARK.	CLAY CROSS.	130, GT. SUFFOLK ST., S.E.

SULPHATE OF AMMONIA.

By Her Majesty's Royal Letters Patent.

DR. FELDMANN'S APPARATUS

The most successful and approved Apparatus known up to the present time.

FOR REFERENCES, PARTICULARS, TESTIMONIALS, AND PRICES, APPLY TO THE

Sole Agents and Manufacturers,

GODDARD, MASSEY, & WARNER,

ENGINEERS,

NOTTINGHAM.

The Apparatus has been supplied to the following Firms—

BURT, BOULTON, & HAYWOOD, SILVERTOWN, and ELING.
CHANCE BROTHERS, OLDBURY (4 Apparatus).
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NETHAM CHEMICAL CO., Limited, BRISTOL.
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KEMPSON & CO., Pye Bridge.

And to the following Gas Companies and Corporations—

ILKESTON.	BURY.	CHORLEY.
WIDNES	BRIGHOUSE.	WHITEHAVEN.
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ALTRINCHAM.	PRESCOT.	SOUTH SHIELDS.
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ST. ALBANS.	LEICESTER.	IPSWICH.
DUKINFIELD.	DARWEN.	BOURNEMOUTH.
NORTHWICH.	NELSON.	SALFORD.
HUDDERSFIELD.	ORMSKIRK.	LUTON.
		HAMPTON COURT.

CUTLER'S PATENT

Guide-Framing for Gasholders.

STRONG. SAFE. CHEAP.

Copy of Letter received from TUNBRIDGE WELLS GAS COMPANY.

Gas Company's Offices, Tunbridge Wells,

April 1, 1890.

Dear Sirs,

I am instructed by the Directors to express their great satisfaction with the Gasholder you constructed for this Company last year, and which is provided with your PATENT SYSTEM OF GUIDE-FRAMING.

The Engineer has reported very favourably, not only of the work itself, which is excellent but of the merits of the PATENT GUIDE-FRAMING, which he thinks fully justifies all you claim for it.

The Directors also appreciate the liberal way in which you interpreted your obligation as to the strength of the material to be used, which, now that the work is completed, is found to be no doubt stronger than it need have been; but inasmuch as our Gasholder was the first to which the System had been applied, they think you did wisely in not reducing the material to the limits which are no doubt perfectly possible in such a Guide-Framing.

I am, Dear Sirs, yours truly,

(Signed) JOHN READ, Secretary.

Messrs. S. CUTLER & SONS,
Great George Street Chambers,
16, Great George St., Westminster, S.W.

JOSEPH CLIFF & SONS,

INCORPORATED IN
THE LEEDS FIRE-CLAY COMPANY, Ltd.,
WORTLEY, LEEDS.

LONDON Offices & Depôts:
Baltic Wharf, Waterloo Bridge.

WHARVES NOS. 2 & 4, INSIDE G.N. GOODS YARD, KING'S CROSS, N.

LIVERPOOL:
16, Lightbody Street.

LEEDS:
Queen Street.

MACHINE-MADE RETORTS

Have been made in large quantities for the last twelve years; and during the whole of that time, have been in regular use at most of the largest Gas-Works in the Kingdom. They possess the excellent quality of remaining as near stationary as possible under the varying conditions of their work—a quality which will be appreciated by all Gas Engineers and Managers. The generally expressed opinion is that these Retorts are the very best that are made.

RETORTS CAREFULLY PACKED FOR EXPORT.

Fire-Bricks, Lumps, Tiles, &c., &c., of every description suitable for Gas-Works.

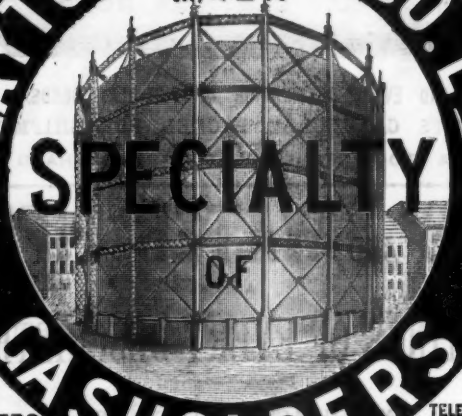
ESTABLISHED MORE THAN A QUARTER OF A CENTURY

WORKS
HUNSLET,
LEEDS

LONDON OFFICE:
60, QUEEN VICTORIA STREET
E.C.

CLAYTON SON & CO. LTD.

MAKE A SPECIALTY OF GASHOLDERS,



AND MAKERS OF GAS PLANT OF EVERY DESCRIPTION.

REG? TELEGRAPHIC ADDRESS: "GAS LEEDS"

JOHN BROWN & CO., LIMITED,

ATLAS STEEL AND IRON WORKS, SHEFFIELD,

ALDWARKE MAIN GAS COAL.

This Coal yields 12,600 feet of 19-candle gas per ton.
Weight of illuminating power in pounds of sperm, 820·80. Very free from impurities.

R. & J. DEMPSTER,

ENGINEERS, IRONFOUNDERS, & CONTRACTORS,

GAS PLANT WORKS,
NEWTON HEATH, MANCHESTER.

BATTERY

OF

THREE DOUBLE-ACTION

Pumps

DRIVEN FROM

ONE STEAM-ENGINE.

The Pumps are provided with suitable Valves for pumping Ammoniacal Liquor, Tar, and Water; and each is provided with Disengaging Gear, in order that any one can be stopped or started while the Engine is in motion.

KIRKHAM, HULETT, & CHANDLERS' LTD.,

NEW PATENT "STANDARD" WASHER.

EXTRACTS THE WHOLE of the AMMONIA

Also a Large Proportion of H_2S and CO_2 from Gas.

MINIMUM WEIGHT IN MOTION.
MINIMUM DRIVING POWER.
MINIMUM BACK PRESSURE.
MINIMUM WEAR AND TEAR.
WITH MAXIMUM RESULTS.

Testimonial from the Chief Engineer of The Gaslight & Coke Co.

The Gaslight and Coke Company, Horseferry Road, Westminster, S.W.,

Messrs. KIRKHAM, HULETT, AND CHANDLER, LIMITED, *Nov.* 25, 1889.

GENTLEMEN,—In reply to your enquiry respecting the result of putting "Wooden Bundles" into some of the Washer-Scrubbers at our Beckton Station, I beg to say they have answered admirably for the few months they have been in; and I think them a decided success.—I am, yours truly,

(Signed) G. C. TREWBY.

NOTE.—The first Washer referred to in the above was fitted with improved "Bundles" in May, 1888; *and these have proved so satisfactory that The Gaslight and Coke Company have had several other "Standard" Washers fitted in the same manner, and have recently given an order for machines for* 6,000,000 *cubic feet per day.*

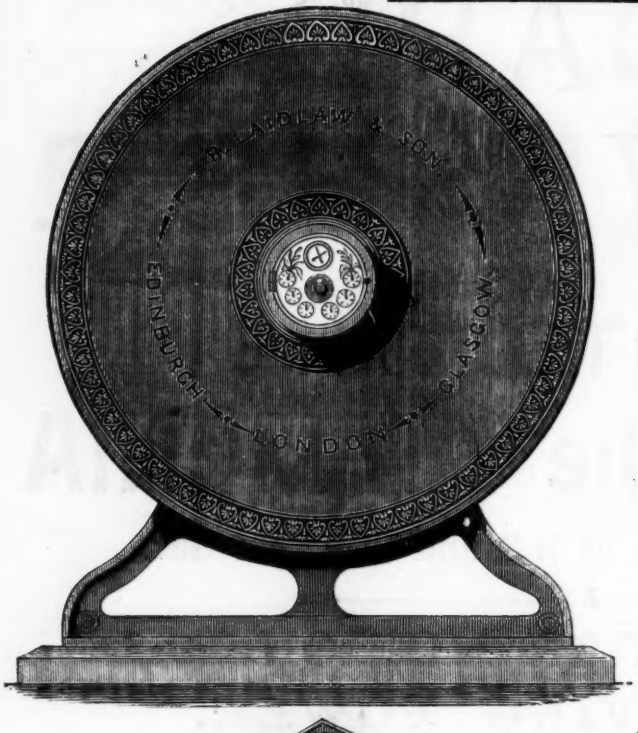
396 "Standard" Washer-Scrubbers supplied (and in course of construction), equal to a daily capacity of 359,560,000 cubic feet of Gas.

FOR LIST OF ORDERS, SEE PREVIOUS ADVERTISEMENTS.

PALACE CHAMBERS, BRIDGE STREET.

WESTMINSTER, S.W.

R. LAIDLAW & SON'S
STATION METERS
IN ROUND OR SQUARE CASES, ALL SIZES.

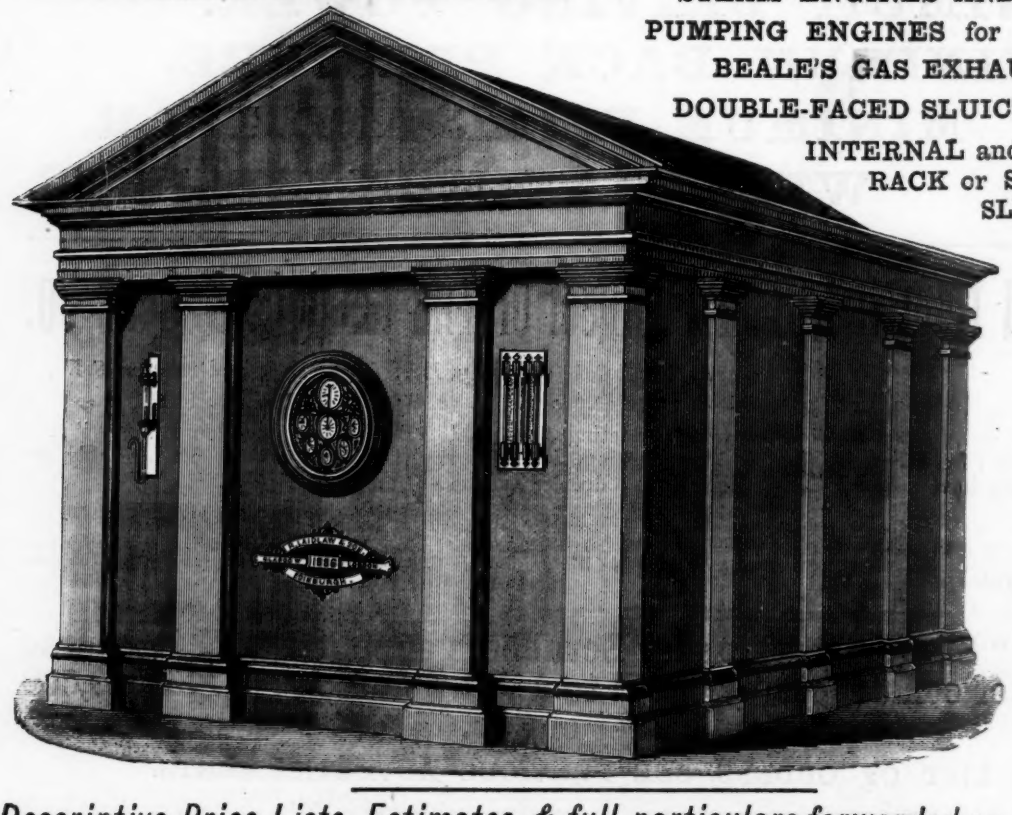


Makers in EDINBURGH of

WET AND DRY GAS-METERS,
IMPROVED STATION GOVERNORS,
PRESSURE REGISTERS,
(To Indicate New Time),
PRESSURE GAUGES, TEST HOLDERS,
EXPERIMENTAL HOURLY-RATE METERS,
EXPERIMENTAL TEST-METERS,
CONDENSER THERMOMETERS,
SIEMENS' WATER-METERS,
STREET LANTERNS,
AND ALL KINDS OF
GAS APPARATUS AND FITTINGS, &c.

Makers in GLASGOW of

CAST-IRON PIPES (all Sizes),
LAMP PILLARS,
STEAM-ENGINES AND BOILERS,
PUMPING ENGINES for Water-Works,
BEALE'S GAS EXHAUSTERS,
DOUBLE-FACED SLUICE VALVES,
INTERNAL and EXTERNAL RACK or SCREW SLIDE VALVES,
CAST-IRON COLUMNS,
BEAMS, GIRDERS, and WATER TANKS.
WROUGHT-IRON TUBES, FITTINGS, &c.



Descriptive Price Lists, Estimates, & full particulars forwarded on application.

ALLIANCE FOUNDRY, **GLASGOW.** | SIMON SQUARE WORKS, **EDINBURGH.** | 6, LITTLE BUSH LANE, **LONDON, E.C.**

IMPORTANT TO
GAS ENGINEERS AND GAS MANAGERS:

The most Economical, Reliable, and Handy Tool for Forge Work for

ENGINEERS, MACHINISTS, TOOL MAKERS, FITTERS, FORGERS, STAMPERS, COACH BUILDERS,

AND FOR USE IN

GAS-WORKS, SMITHIES, IRON-WORKS, COLLIERIES, &c., &c.,

IS

THE TANGYE GAS-HAMMER

(ROBSON & PINKNEY'S PATENTS)

As supplied to several of the principal Gas-Works.

TANGYES LIMITED
SOLE MAKERS.

As supplied to several of the principal Gas-Works.

Hand Gear. (*From Photos of the ¾ cwt. size.*) **Foot Gear.**

THE above illustrations represent THE TANGYE GAS-HAMMER as now made. Since its introduction it has been greatly improved both in design and simplicity of working. It has also been constructed to work either with Hand Gear or with Foot Gear.

This—the first Gas-driven Forging Hammer introduced—was designed, and at first recommended only for use in cases where steam was not available or could only be employed at great expense, but the data given below, and which are founded upon reliable and sustained test and trial, demonstrate that the **GAS-HAMMER** may be economically used in competition with the Steam-Hammer, even in places where the price of gas is at its highest.

"*Since the appearance of our* ['*The Engineer*'] *notice, the Hammer has been in some respects re-modelled, and its remarkable economy placed altogether beyond a doubt. . . . The Hammer described is that known as the ¾ cwt. size, and has a cylinder of 7 in. diameter and 6½ in. stroke. The maximum blow is very nearly that which would be given by* **a weight of 3 cwt. falling through a height of 1 ft.**; *and this can be repeated at the rate of* **110** *blows per minute. . . . Extended test in practical smith work has demonstrated that over* **2500 of the heavier blows** *referred to above, can be given with* **one pennyworth of gas** *at half-a-crown per* 1000 *feet—i.e., the Birmingham price to small consumers—or over* 4500 *varying blows for the same consumption.*"—**"The Engineer," Sept. 10, 1886.**

The Gas-Hammer dispenses with Boilers, Coals, Ashes, and Dirt necessitated by Steam-Hammers.

It is ready for work at any moment, day or night, and works as economically for a few minutes' spell as when in sustained operation.

PRICE LISTS AND FULL PARTICULARS ON APPLICATION.

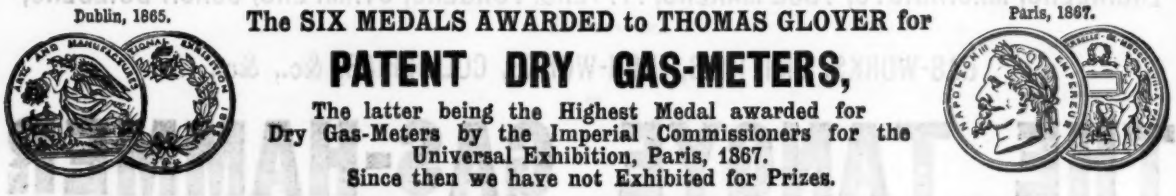
Tangyes Limited, CORNWALL WORKS, Birmingham.

London, Newcastle, Manchester, Glasgow, Paris, Sydney, Melbourne.

ESTABLISHED 1844.] **ORIGINAL MAKERS.** [ESTABLISHED 1844.]

London, 1851. New York, 1853. Paris, 1855. London, 1862.

Dublin, 1865. Paris, 1867.



The SIX MEDALS AWARDED to THOMAS GLOVER for

PATENT DRY GAS-METERS,

The latter being the Highest Medal awarded for Dry Gas-Meters by the Imperial Commissioners for the Universal Exhibition, Paris, 1867.
Since then we have not Exhibited for Prizes.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 to 222, ST. JOHN ST., CLERKENWELL GREEN, LONDON, E.C.

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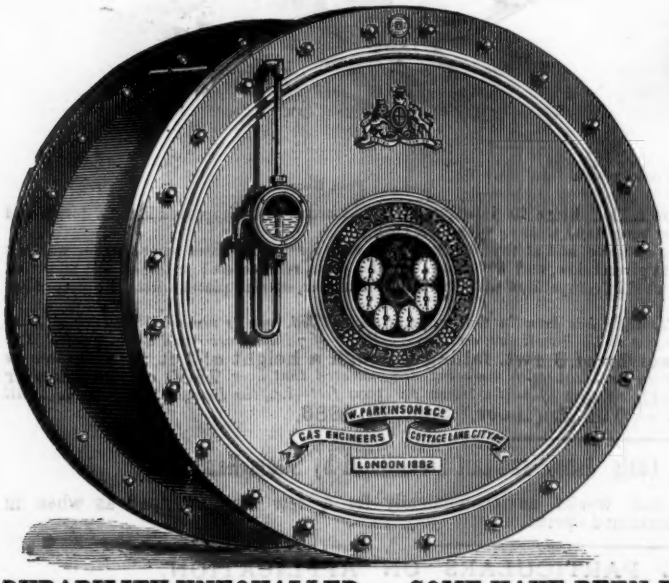

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THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, AUGUST 19, 1890.

Sliding-Scale Dividends.

A CORRECT understanding of the true working of the sliding scale, whereby the price charged by a Company for their gas and the rate of dividend they are authorized to declare are made to rise and fall inversely, is of such importance, that we shall make no apology to our readers for recurring to the subject and discussing it more fully. The question arises out of the action of The Gaslight and Coke Company in regard to the dividend declared for the half year ending June 30, 1890, and of the Governor's observations thereon at the recent meeting. The Company's standard price is 3s. 9d. per 1000 cubic feet; and the Act of Parliament which regulates the dividend enacts that "for every penny or part of a penny charged in "excess or in diminution of such standard price *in any* "*year*, the standard rate of dividend . . . shall *for such* "*year* be reduced or increased by five shillings in the "hundred pounds per annum." The price charged by the Chartered Company from January to June was 2s. 6d. per 1000 feet—a diminution of the standard by fifteen pence; but the price from the 1st of July forward was raised to 2s. 9d. These being the undoubted facts of the case, the question is: Would a dividend for the first half year at the rate of 13¾ per cent. be justifiable? Its solution seems to depend upon the right construction of the words italicized in the quotation. In his address to the proprietors the Governor said: "They had been criticized somewhat "for having reduced the dividend this half year, when the "price might have been thought to warrant 13¾ per cent.; "but, by the construction of the Act and the decision of the "Board of Trade Auditor, they had found it would be very "questionable, if not absolutely wrong, for them to declare "a larger dividend [than 13 per cent.] for the past half "year." By this construction, the widest possible distinction is drawn between the two expressions "*in any year*," and "*for such year;*" and the most indeterminate meaning, in point of duration of time, is assigned to the word "in." So that practically the expression "in any "year" is made to have the effect of "for any portion of a "year;" while "for such year" means "for the whole "of such year." Thus, because *in* the year 1890 (that is to say, on the 1st of July, 1890) you raised the price of gas by 3d. per 1000 cubic feet, therefore for the whole of the year you shall only enjoy a reduced dividend. We cannot acquiesce in this view. We believe that the true intention of the Act was that price and dividend should be strictly correlated, and that when the consumers have had the benefit of a half-year's cheap gas, the proprietors should have the benefit of the right to a proportionate increase of dividend. If to this it should be objected that the section of the Act above quoted does not contemplate half years, we reply to the objector, first: You yourself have broken the solid year by making the price of one half govern the dividend of the whole; and, secondly, that the Act elsewhere distinctly recognizes the half year as an integral and complete period, for it prescribes that the Company's accounts are to be made up half yearly, to be audited every half year, and certified for the express purpose of the declaration of a dividend half yearly, and to be "forthwith" (*i.e.*, necessarily half yearly) laid before Parliament. The Companies' Clauses Act is to the like effect in respect of half-yearly periods. But let us introvert the process, and look at it so. Suppose the Company, or, let us say, suppose a company (for there are many under exactly similar statutory obligations, and this is what gives the question its importance), starting with a half-crown price in January, were to lower the charge by 3d. on the 1st of July. Could it be contended that the company would be entitled to declare a higher dividend by ¾ per cent. for the first half year as well as the second? Pushing it still further, let us assume that the reduction in price is postponed until the 1st of October (and this would be a diminution "*in*" the year, according to the letter of the Act), would the company be entitled to declare the higher rate of dividend over the other three quarters of the year? The fallacy is transparent. We are not aware of there being any case of a sliding-scale company having (prior to this year) increased the price of gas, and therefore we cannot point to any exact precedent. But there have been numberless instances of the converse process—a reduction of the price; and never before has it been contended that a prospective change in the price to be charged should have a retrospective effect upon the distribution of the profits of a period passed and closed. Precedent, practice, and principle forbid it.

While upon the subject of the sliding-scale clause, we will own to a regret that the phraseology employed in the section of the Act is not more precise; and will point out how, in another respect beside that just now discussed, a literal construction of a part of it would defeat its spirit and intention. Take the words: "For every penny or "part of a penny charged in excess or diminution," &c., and suppose the case of a company dissatisfied with their standard price of (say) 3s. per 1000 cubic feet which

authorizes a 10 per cent. dividend. If the company reduces the price by ½d. for the first half year, and 1d. for the second half year, and repeats the operation in the following twelvemonth, it will practically have attained to a 10 per cent. dividend with a price of 3s. 1d. *Quod est absurdum.*

One other point. The Company appear to have taken a "decision" of the Board of Trade Auditor upon the legality of their paying a 13¾ per cent. dividend for the half year. Now, with all due respect to the office of Auditor, and to the gentleman who so ably and impartially fills it, if this is to be taken as a binding and authoritative declaration of the true meaning of the sliding-scale clause, the matter is one which seriously demands further consideration. Is such a decision within the statutory powers of the Auditor? These are very fully and minutely laid down by the Act, and appear to be limited to the ascertainment of the Company's capital, prescribing the form of accounts, and the periodical audit of the same half-yearly. After the accounts have been certified as correct by the Auditor, the dividend is declared and paid; and the amount so distributed appears in the accounts of the following half year as a payment made. But if in the opinion of the Auditor the rate of the past dividend paid should be excessive, would he be justified in declaring incorrect the accounts of the subsequent half year, which correctly state the item of expenditure? Adequate legal machinery for compelling the company, if necessary, to comply with the statutory limitations imposed on their power to appropriate profits will probably be found to exist, notwithstanding their exemption from the provisions in that behalf of the Gas-Works Clauses Act, 1847; but we cannot feel satisfied that it dwells in the circuitous and inartificial process involved by enabling an Auditor to hold subsequent accounts in suspense. The view that the objection to an alleged illegal rate of dividend must come from another quarter has some measure of confirmation in the use by the Governor of the term "questionable," which appears to indicate the extent to which the Auditor probably gave his "decision."

The South Metropolitan Report and Accounts.

THE report and accounts relating to the past half-year's working of the South Metropolitan Gas Company (the former given in the JOURNAL last week, and the latter appearing elsewhere) naturally call for exceptional consideration, in view of the crisis through which the Company has passed. The preceding report and accounts told the tale of the strike of last Christmastide; but only in part. Those now submitted to the proprietors and the public give the sequel. The Directors state that although after the first day of the strike all doubt as to the possibility of the new hands keeping the district supplied with gas was dispelled, the harassing action of the strikers compelled the Company to continue an extraordinarily heavy expenditure for food and wages for the first five or six weeks of the new year. A good deal of expense has also been incurred under the heads of repair and maintenance and distribution, for providing employment of various kinds for the new hands when they were no longer required in the retort-houses; the policy of the Board having been to settle these recruits near the works wherever possible, so that they might be ready when wanted. It may be remarked, in passing, as a curious illustration of the severity of the struggle for existence carried on by every man in his own place, even in such a press of humanity as there is in London (where it might be thought that the sudden addition of one or two thousand fresh competitors would be imperceptible), that the importation of their new hands by the Company appears to have had a wide-reaching effect upon the teeming South London population. Having suddenly called into being, as it were, this additional brigade of London workers, the Company have had to act the part of an earthly Providence towards them, protecting and helping them to maintain their footing in ways that the natural additions to population have to manage for themselves. In other words, the Company have been compelled to undertake special responsibility in acclimatizing their stranger levies; and this has been done at great expense, because of the animosity displayed to the new-comers by those who have been supplanted by them. Furthermore, the Company have trangressed the law of Political Economy, which prescribes ruin and death to the losers in an industrial rivalry, by providing work for those who have inflicted such heavy loss upon the undertaking, and suffered so grievously themselves in so doing. The report recounts how "the Directors have, as far "as lay in their power, found work for the old stokers, "whose case is in many instances most pitiable; numbers "of them being left by the Union, with their wives and "families, to starve, after having parted with everything "from their former comfortable homes." This passage of the report may be commended to the careful attention of workmen who have not as yet had experience of the tender mercies of the Union officials, when called upon to carry out their seductive promises and act as paymasters.

The strike also caused an increased outlay for coals, in a way explained by the report; a stock of Yorkshire coal having to be laid in to counteract the threatened stoppage of the sea-borne supply. All this, and much more that the report could not explain without going into unnecessary and perhaps wearisome detail, cost a great deal of money. But the end was attained, which is the main thing; and the Directors learnt, although dearly, that "in the most "improbable event of another strike, it is certain it could "be dealt with successfully by a very moderate expendi-"ture." As to this, it may be remarked that, throughout the history of the world, the nations have been trying to learn how to make war cheaply; but in vain. It is, as the report says, most improbable that the South Metropolitan Gas Company will have another strike to deal with, in a future which a practical man need provide for; but should such an affair arise, it will hardly repeat the features of the last. Still, the lessons of the past winter must bear fruit; but the most striking teaching of all which the South Metropolitan and the other gas workers' strikes has for an observer is left entirely unnoticed by Mr. Livesey, who, in his capacity of Chairman, signs the report. He says that "it can be seen, on looking back, "there never was any real danger of failure;" but this is hardly the whole truth. There would have been very great danger of failure but for the men who had the business in hand. With them, indeed, success was almost a foregone conclusion; but what would have been the consequence if a weak, divided, and incompetent authority had been in charge of the destinies of the Company during that emergency? The report goes on to acknowledge the cheerful and loyal spirit of the existing working staff, and the great success of the profit-sharing scheme. It is stated that all the men are under long engagements for service, terminating at different times; and that difficulty now lies, if anywhere, not in inducing men to sign, but in finding employment for all who wish to do so. The amount of the bonus credited to the men at the end of the half year was £5821. Full particulars of this matter will be found in a recent issue of the JOURNAL; and therefore it need not be further discussed now.

There is a paragraph in the report dealing with the attitude of the consumers of gas in the Company's district, many of whom were considerably inconvenienced by a short supply during the period when the demand for light and heat is usually heaviest. It might have been feared that when the full supply was resumed, these consumers would have learnt to do without it; but that such is not the result is proved by the statement that since the supply has been as abundant as of yore, the increase of consumption in the district, in comparison with the corresponding period of 1889, has been after the very satisfactory rate of 5·12 per cent. Turning to the accounts, it appears that the total quantity of gas accounted for stands at 2,826,021,000 cubic feet for the half year, as compared with 2,887,727,000 cubic feet for the corresponding period of last year; but since from the darkest weeks of the new year the pressure at the works had to be reduced from the normal 35-10ths to 19-10ths or thereabouts, the difference is easily understandable. It is shown that 19 per cent. of the total number of consumers have gas-stoves on hire, in addition to the considerable number privately owned. It must be conceded, therefore, that the Company have done very well in this respect, thanks in a great measure to their system of advertising by means of gratuitous lectures and exhibitions.

The paragraph of the report which refers to the current extensions of the Company's plant furnishes interesting intelligence for the gas engineer and constructor. It states that the first five-lift gasholder ever built has just been completed at Rotherhithe; while the largest (telescopic) holder at Kennington is to be doubled; and a tank 303 feet

in diameter by 30 feet deep is being constructed by the Chief Engineer (Mr. Frank Livesey) for a six-lift holder at East Greenwich. This is the tank that, as already mentioned, is being made by the Company themselves—dispensing with a contractor—in order to find summer employment for the stokers and old hands wanting work. The content of the mammoth holder when completely filled will be 12 million cubic feet.

Next comes the financial matter of the report. It is announced that the price of coal has advanced by nearly 5s. per ton during the last two years; but there is no present intention of raising the price of gas. A heavy dip into the reserve fund is contemplated instead; thus repeating the tradition of this Company for the time of the coal famine fifteen years ago. The dividend is to be kept down for the present, however, to 12 per cent., in order to assist in defraying the cost of the strike; the remaining moiety of the direct expense falling upon the insurance fund. All the rest of the money required for dividend and interest, to make up the deficiency in the revenue account, will come from the reserve. To prevent misrepresentation, it is remarked that a nominal 12 per cent. dividend only means a return of 5 per cent. to the present investor. This explanation, although apparently superfluous, is probably designed to cut the ground from under the feet of the carping Socialistic critic, who in his own organs and on his platforms is pretty sure to indulge in a gibe at the idea of a concern paying a 12 per cent. dividend making any particular sacrifice in what has been done for its workmen and customers as well as for the general public.

Referring to the revenue account, it appears that the income from the sale of gas amounted to £316,848, as against £324,485, or a drop of £7637. Stove and meter rentals have increased; thus proving that the diminished output was not due to a falling off in the number of customers. Residuals, on the other hand, have mounted from £121,375 to £136,946, or a rise of £15,571, which is something to be thankful for under the circumstances. Altogether, the gross revenue amounted to £465,201, as compared with £456,002 for the corresponding half of 1889; being nearly £9000 to the good. On the other side, however, the figures are all one way. Gas manufacture cost £299,552, as compared with £252,217 before strike conditions obtained, or a rise of £47,335, of which nearly half was for dearer coal. Distribution has cost £4744 more; but rates and taxes are slightly less. The respectable sum of £31,978 appears in a special entry as "strike "expenses." The total expenditure was swelled by these various increases in the outlay to £405,920, as against £319,644, or an extra burden of £86,276—a very serious amount to contemplate. Consequently, down goes the profit balance to £59,280, as compared with £136,357. Thus not one-half of the money required for dividend and interest for the six months has been actually earned out of the business done. Seeing that the reserve fund still stands at £198,837, and the insurance fund has yet £12,579 to its credit, the situation is anything but desperate, notwithstanding the heavy pulls made on the resources of the Company by one vicissitude after another in their recent history. That a profit of £13,686 should have been made on the sale of the reserve investments required to be realized on this emergency, shows that the old savings of the Company were prudently dealt with. In view of all the circumstances, the general meeting of the Company to be held to-morrow should be exceptionally interesting.

The Cost of the Salford Gas Strike.

The annual report of the Salford Corporation Gas Committee, an abstract of which we published last week, shows the results of the strike at the works, which, be it remembered, was ordered by the leaders of the men purely out of "sympathy" with the Manchester men who had struck at the same time in order to enforce a piece of Union despotism. The most glaring effect of the disturbance of the Committee's business is a falling off in the output of gas from 944,708,000 to 857,770,000 feet. This decrease means a reduction of £8090 in the gross receipts, and necessarily a serious inroad on the net profit that would otherwise have been realized. The bare money cost of the strike was £2864; and the indirect expense and waste was admittedly considerable, although it cannot be exactly ascertained. It is curious that alongside this entry for extraordinary strike expenses there should appear the statement that the increased rates of pay and shorter hours of labour granted to the workmen in October last have cost the Committee about £3000. If these figures were placed upon record without explanation, a reader who had only common sense to guide him in interpreting them, would think that they tell a history like the following: The workmen struck for more pay and shorter hours, which the employers resisted at great cost and loss, but afterwards gave in; and the accounts show both the cost of the strike and what the men gained by it. This is precisely the way in which ancient inscriptions are deciphered. Records left on incised bricks or scratched on ivory are read in the light of the ordinary motives and passions of humanity; and in no other way can very much of the necessarily fragmentary history of the forgotten past be reconstructed into a consistent narrative. Yet, as we know only too well, the argument from probability would utterly fail to rightly interpret the balance-sheet of the Salford Gas Committee. We know that the advance of pay and the shorter hours of labour preceded the strike; and that the latter had no connection with the alterations of pay and work that would in the ordinary way be coupled with it. The employers' money was wantonly wasted, and their property damaged, for no shadow of a fault of theirs; and the men who had obtained higher pay and had less work to do for it threw away these advantages, for others to pick them up. Of all the topsy-turvy actions that were ever perpetrated by men calling themselves sane, surely here is one of the oddest. Messrs. Gilbert and Sullivan never imagined conduct more grotesque than a curious observer in another era would perceive this of the Salford gas workers to be, if he were by chance to stumble upon the rights of the story after constructing his own theory on the statements found in the accounts alone. Unfortunately, it is impossible to laugh at this comic-opera-like transaction of real life. Tears and wailing mark the developments of these ludicrous incidents in reality, where the performers, unlike those on the boards, do not go home comfortably to supper after the curtain is rung down, for the sufficient and sad reason that they have not the wherewithal. The Salford stokers have suffered greatly for their folly; but it would be more satisfactory if one could be sure that the heaviest suffering has fallen on the worst offenders. Unfortunately this is hardly ever the case, and is certainly not so in regard to the Manchester and Salford strikes.

WATER AND SANITARY AFFAIRS.

Our suggestion that there were two gentlemen entitled "Archibald E. Dobbs" seems almost confirmed by a letter in *The Times* of Friday last, which appears over that signature, and which commences by saying "Mr. "Archibald E. Dobbs made a statement at the Guildhall "inquiry," &c. Dobbs upon Dobbs is an ominous kind of critique; but, laying aside the form, and looking at the substance of this letter, we observe that it amounts to an argument that Mr. Dobbs is really at one with himself, and has uttered no contradiction in saying that the Water Companies were charging less than they might, and yet were exacting more than they ought. We read in the recent letter: "No doubt Mr. Dobbs believed his state-"ment to be true." But which statement? One statement was this, unless the reporter blundered: "The "Companies at the present time levied the maximum 3 per "cent. in all cases; but in the case of larger houses they "only levied the 3 per cent. upon half the rateable value, "while in the case of the smaller houses they levied on "the full value." Thus, Mr. Dobbs went on to say, "the "Companies could at any time double their rates in the "case of the larger houses;" and by so doing "could "handicap the trade of London if they chose, practically "doubling the rates which they were now levying in a great "portion of the City." If so, what reason is there to apprehend that the terms on which the Water Companies are to be bought up will include any "capitalized "illegality?" The petty overcharges which one Mr. Dobbs or the other says are perpetrated by the Water Companies, surely fade into insignificance compared with legal charges of such magnitude as to "handicap the trade "of London," and double a large portion of the water-rates. Mr. Dobbs admits, in his latest manifesto, that in

levying these charges to which he takes exception, the Companies have "some colourable support under their "loosely-drawn Acts." If this ardent controversialist admits so much in favour of the Companies, how much more might be said for them by an unbiassed judge. Mr. Dobbs still shows his annoyance at the quiescence of the Companies. He wants a fight, like the hero of Donnybrook Fair. "What do the Companies do?" he asks, and then replies: "They do nothing." They will not come to the Guildhall inquiry; and he has arrived at the conclusion that they are acting "wisely." "They are in receipt of "their income, however made out;" and he confesses that "Perhaps the difference between the parties"—that is, Dobbs and the Companies—"is verbal." He thinks perhaps they differ as to the meaning of the word "illegal." We venture to believe there is not much difference as to the interpretation; the point lies in the application. But Mr. Dobbs has something practical to suggest. He intimated this some time ago; and we trust he will soon let the world into the secret.

It is startling to find to what an extent members of Parliament are ignorant of matters which they nevertheless undertake to bring before the notice of the House. The public have only just got over the scare created by Mr. Tatton Egerton with reference to the Grand Junction supply, when Mr. Baumann interrogates the President of the Board of Trade with respect to the alleged pollution of the Thames by the presence of house-boats on the stream. Mr. Baumann asked Sir Michael Hicks-Beach whether, "in the interest of the public health," he would direct the official representative of the Board of Trade on the Thames Conservancy Board, to urge upon the Conservators "the necessity of taking some steps to prevent "this nuisance." The representative of the Board of Trade must have been very much asleep to require the proposed jogging; but Mr. Baumann, who had doubtless received the last annual report of the Thames Conservators, issued as a parliamentary paper a very few weeks ago, could never have read its brief contents, or he would have been acquainted with this paragraph: "The Conser- "vators' officers continue to watch house-boats and steam- "launches, with a view to the detection of any pollution "from those vessels." Sir M. Hicks-Beach very properly directed his interrogator's attention to this statement, but promised also to communicate with the Thames Conservancy Board on the subject. Passing from the Thames to the Lea, we find a letter in *The Times* referring to "the treated sewage of Hertford," which is described as slowly flowing into the Lea through an open cutting about two miles in length. The writer of the letter considers that, as cholera is so near our coasts, it is high time for another inquiry into this question of the Hertford sewage, as "affecting the health, and possibly the lives, of "many thousands in London who partake of the "waters of the Lea." We see no objection to the inquiry, if only some practical result would accrue from it. But Major Lamorock Flower, in his evidence before the Guildhall Committee the other day, stated that the intake of the New River Company was so situated that none of the sewage of Hertford ever entered it. "That sewage," he explained, "had been diverted, "and entered the Lea at another point." Of the New River water he declared that it was "perfectly pure." To this effect we have the last monthly report from Dr. Frankland, as well as similar testimony in previous reports. The New River Company's supply in July, as also that of the East London Company, is described as exhibiting "a high degree of organic purity;" the former being mentioned as "again especially distinguished in this "respect." For the first time, so far as we can remember, the New River water, seen through a stratum 2 feet deep, is specified as "clear and colourless," in common with the Kent, Colne Valley, and Tottenham waters. Whatever may be going on at Hertford, evidently no harm has accrued to the New River supply, or to the East London.

Mr. Armytage, Assistant-Surveyor of Preston, has been elected by the Yeovil Town Council to the posts of Borough Surveyor and Manager of the Water-Works.

Mr. W. J. Liberty, who has been engaged in the City Architect's Office during the past eleven years, has been appointed by the Commissioners of Sewers to the post of Inspector of Subways and Gas Lighting.

ESSAYS, COMMENTARIES, AND REVIEWS.

GAS AND WATER COMPANIES IN THE STOCK MARKET.

(For Stock and Share List, see p. 414.)

With the revival of business after the holiday period, a better tendency prevailed in most markets of the Stock Exchange. Money was decidedly easier; and an improved aspect of political affairs abroad, with good trade and traffic returns at home, combined to elevate prices to a moderate extent. Gas was fairly active in the earlier part of the week; but after the settlement, business quieted down. Gaslight "A" was very firm, and was done steadily at about 244 with the dividend in it, and *ex div.* it was rather better still—the quotation being relatively 1½ higher, and the last prices, on an average, about 239. Little was done in the preferences. The new "K" 6 per cent. preference will consist of £176,000 stock, for which tenders not under £145 per £100 stock are invited. The limit price will afford about the same return for money as the "G" 7½ per cent. preference returns at present market price. The issue of the South Metropolitan Company's accounts supplies further information to show how costly was their great struggle with the Gas Workers' Union. But whatever the cost, it must always be borne in mind that to yield or to be beaten would have been far more expensive still. In the result, the Company earned about £60,000 in the half year. On the balance of profit and loss they are about £11,000 to the good; and the reserve fund will have to furnish nearly £50,000 to cover the dividend. The Company's stocks have gone back in market quotation from 1 in the "A" to 4½ in the "C." Nothing has occurred in Commercials; and, according to precedent, it will be another month and more before the accounts are issued. Suburban and Provincial Companies have made no move in the market. Business in Foreign undertakings has been only moderate; but they are firm generally, and the variations of quotation which have occurred are in the upward direction. Europeans are now quoted "*ex new*," and "*ex bonus div.*;" and at present we have no data upon which to calculate future dividends and yield upon investment. The columns in the list devoted to this information must therefore remain awhile blank. Water Companies have been quiet, and almost without movement. Chelsea is 2 higher; but Kent (which met last week, and declared the usual 10½ per cent. dividend) has a nominal open quotation, the reason for which is beyond our conjecture.

The daily operations were: Business in Gas was rather quiet on Monday. Prices generally were good, though Gaslight "A" was a little irregular. The only move was a rise of ¼ in Oriental. Tuesday's business was very largely in Gaslight "A" at extremely steady figures. Quotations were unchanged. Transactions were more restricted on Wednesday, the feature of which day was the fall in South Metropolitan—"A" receding 1; "B," 2; and "C," 4½. There was more animation in Gas on Thursday. Better prospects in Argentina brought Buenos Ayres and Monte Video into notice. Gaslight "A" improved 1½, on *ex div.* adjustment. Chelsea Water rose 2. Business became quieter on Friday; and prices were not particularly good, except for Imperial Continental. The tendency on Saturday was more favourable; but the only change was an advance of 1 in Imperial Continental.

ELECTRIC LIGHTING MEMORANDA.

A Conflict of Testimony Respecting the Development of the Electric Lighting Business—The St. Pancras Scheme Adopted—The Affairs of a London Electric Lighting Company.

It has been noticed repeatedly in these columns that the cream of the electric lighting business, particularly in London, is being taken off by the large installations put up for their own use by some of the principal theatres, banks, and public institutions. So conspicuous is this movement that it was with some surprise that we noticed a remark of directly contrary import, made to the proprietors of the Manchester Edison Company by their Chairman (Mr. V. K. Armitage) at the recent annual general meeting of the Company. Mr. Armitage had to explain the reason for the Company having made only sufficient profit for the past year to enable them to pay a 5 per cent. dividend; whereas the year before they managed to pay 10 per cent. It was impossible to deny that the business of the concern had declined; and this unpromising phenomenon was ascribed to a "manifest falling off all over the country in the demand for small separate installations." Of course, all depends upon what is meant by a "small" installation. If the speaker referred to those little experimental plants of from 10 to 20 lamps, or thereabouts, such as used to be shown at agricultural and other exhibitions, and were occasionally bought for amusement by rich amateurs of science, he was doubtless correct; for there is less toying with electric lighting in this manner than there was when it was a greater novelty. If, however, Mr. Armitage meant his words to apply to private installations of considerable importance, such as those to which we have referred as spoiling the market for the large companies, his information does not tally with our own observation. He was fain to express the belief that "electric lighting would increase enormously in the near future;" but conveyed the impression that this would be in connection with the anticipated large development of central station lighting. This is where we differ from him in a general

way; while conceding that possibly Mr. Armitage may be justified in speaking thus in regard to Manchester and the neighbourhood. On the whole, however, it seems tolerably certain that the field for electric lighting in most populous centres in this country is a strictly limited one, and that every considerable private installation must therefore encroach irremediably upon the domain of the public ventures of the same kind.

St. Pancras, London, will soon have the benefit of a well-designed central electric lighting station on the low-pressure system; the Vestry having decided to carry out the plans of Professor Robinson, several times referred to in these columns. We have nothing to say against the technical part of this experiment; and the Vestry will not be ruined by what they contemplate doing, even if they fail to secure the profit they seem to expect from their new business. We hold the opinion, however, that the inhabitants generally will be disappointed in the amount of comfort they will get out of the contemplated establishment. There is nothing more annoying to a Local Authority of this order than the charge that they are favouring one section of their area to the detriment or disadvantage of others; and in this case, it is probable that those vestrymen who happen to represent wards that will not greatly participate in the benefits—such as they are—that may be obtainable from the electric light station will prove the unkindest of critics of the whole affair. It has been stated that this St. Pancras scheme is largely modelled on the St. James's establishment, which is reputed to be one of the most successful in the kingdom, although very little is heard of its commercial results. It is obvious, however, that the two parishes differ in all respects as widely as any two London parishes that could be named in the same breath; and it remains to be seen how far the example of the one can be satisfactorily followed by the other.

Those who may be curious with regard to the technical aspect of the prospective St. Pancras experiment may be directed to the Knightsbridge and Kensington establishment, which very closely resembles it in the main particulars of the electrical plant. This venture was started at Kensington in 1887; and a second station in the eastern part of the district has recently been added. The mains are laid through about 10 miles of streets, and consist of bare copper rods resting on insulated supports in concrete culverts. The system is that of a low-pressure continuous supply, assisted by accumulators to keep the pressure constant and prevent breakdowns. It is stated that during the three years and a half of the Company's existence, there has only been one failure of the light, which occurred soon after starting. Upwards of 15,000 lamps are reported to be on circuit, distributed over 178 houses, which gives an average of not quite 85 lamps per house—a significant indication of the class of trade upon which central station lighting has to depend. Although in the *Electrical Review*, which gives these particulars in a long descriptive article devoted to the affairs of the Company, it is stated that the working of the Kensington station is believed to be more economical than any other station either in England or abroad, it is confessed that no data are forthcoming whereby this belief can be justified. The absence of all working returns from descriptions of this character certainly looks as if the financial success of even the best-managed central lighting establishment in Europe hardly bears out the technical triumph claimed. The concluding words of the article are significant in this regard. It is remarked as desirable that the public inhabiting the houses along the route of the Company's mains "will avail themselves to a large extent of the facilities thrown in their way, and use the electric current in such quantity as will suffice to *somewhat recoup* the Kensington and Knightsbridge Company for the heavy outlay to which it has been put in starting its system." The italics are ours, and indicate where it seems to be admitted that the pinch occurs. There is no longer any confident prophecy that the whole of the gas-lighting in this rich and prosperous neighbourhood will be abandoned in favour of the new light; but only that the latter may be made to pay its way. It remains to be seen how many more large places of business and mansions in Kensington and Knightsbridge will patronize the Company, which will mean the point of saturation for the district. It has always been our contention that this point must be speedily attained for any electric lighting system; and the Kensington example supports this view. Whether when the point of saturation is reached, the Company will or will not be in a position to pay dividends is a semi-private question, depending upon the first outlay and cost of working—that is to say, upon the skill and judgment of the Company's technical advisers and business managers.

Mr. John Bawtree Harvey, who has been Chairman of the Colchester Gas Company since the year 1865, died at an early hour on Sunday morning of last week He was born at Ipswich on April 17, 1809. The funeral took place last Thursday; among those present being Mr. H. S. Pike, the Manager of the gas-works.

Recording the Height of Water in Reservoirs.—Electrical apparatus to indicate and record, in the Surveyor's office at the Town Hall, Tunbridge Wells, the varying depths of water in the main reservoir, is about to be fixed for the Tunbridge Wells Corporation, under the direction of Mr. W. Brentnall, the Engineer.

THE VALUATION OF GAS COALS.

Several of our readers who follow the plan of advertising for the supply of coals, will find themselves at this season of the year sitting down before a pile of a dozen or more tenders received from various parts of the country; and if, as will probably be the case, several of the quotations run very near to each other, there will be some difficulty in arriving at a clear decision as to which coal is really the cheapest. The valuation of a gas coal, it need scarcely be remarked, is something considerably beyond a question of mere cost. A ton of coal, in the eyes of a gas engineer, represents a certain bulk of gas, a residue of saleable coke, and some tar and sulphate of ammonia. Behind these loom the expense of labour for purification, to which in some cases must be added the question of sulphur compounds; and there is also the consideration of retort-house labour and wear and tear. And beyond all this, the way the coal trade is conducted renders it desirable that the purchaser should know something as to the standing and position of the firm with whom a contract for the supply of a large quantity of coal is to be concluded.

A practical (!) analysis of the coal from the laboratory of some well-known authority is usually to be obtained from the vendors; but, on account of reasons that have been repeatedly stated in these columns, the information afforded in a report of this kind is not of a "practical" character at all, and this apart from the fact that a sample taken perhaps some ten years ago is by no means a fair representation of the kind of coal that is being won to-day. Several items above alluded to are not touched upon at all in the laboratory test. But the chief objection to an experiment on a small quantity of coal is the fact that the mineral is rarely of a homogeneous character all through. It would not be a difficult matter to pick out from a truck-load of coal several small parcels, each of which would, in the hands of the analyst, give different results from the others.

Failing more definite information, the engineer is obliged to fall back upon the results of his personal observation and experience; and this, if it happens to cover the various classes of coal submitted to him, will suffice to enable an arrival at a fairly accurate decision. But how many managers of gas-works are able to attain this standard? As a rule, their experience is confined to coals of one district, and does not extend to anything like a general acquaintance with the coals of the United Kingdom. Some have confined their attention to the case of one undertaking only, and many have not been connected with more than two or three; so that perhaps the whole number of different kinds of coal they have practically worked in bulk does not exceed about a dozen.

The investigator may fall back upon the published information about gas coals and the value of the products obtainable from them, of which there is a very large quantity of matter ready to hand. But he will find considerable difficulty in extracting from these sources anything beyond information of a very general kind, which, though interesting and useful in itself, is not exactly the kind of thing he wants. It is more suited to the requirements of the student in the class-room than to those of a commercial man in his office. He will be puzzled by the fact that various experimenters arrive at different results from the same coal, and that the published experiments extend over nearly half a century. The earlier ones were evidently taken with other kinds of apparatus and under different conditions than those of recent date; and this necessarily robs them of any value, for comparative purposes, that they might otherwise possess. He may, however, be so fortunate as to find that the various classes of coal under consideration have all happened to come under the notice of one particular authority, in which case he might assume that a similar mode of proceeding had been followed in the case of each sample, and therefore that the results, independently of any absolute value they might possess, were fairly reliable for purposes of comparison. But this, at best, is a somewhat doubtful prospect.

Yet information of a nature just suited to his purposes exists broadcast throughout the country. With certain reservations, the yearly balance-sheet is the best criterion of the value of a gas coal. Assuming that the works are in charge of a skilled and experienced manager, and also that he is not hampered by any structural defects that prejudice his working, it is fair to assume that, on the whole, he will do justice to the quality of the coal used, and obtain from it in a practical sense the best value it is capable of affording. In actual working, there are occasionally a number of circumstances which influence the results, and which perhaps are known to be prejudicial to them, but nevertheless cannot be remedied at all, or only very gradually. If an engineer "takes on" an established undertaking, and finds that the retort-settings in use are not of the most modern character, and, in fact, fail to the extent of about 10 per cent. to extract, in the form of products, the full value the coal is capable of affording, he cannot remedy the defect at once. At best, it will be a matter of a year or two; and possibly, on account of pecuniary considerations connected with the raising of capital, &c., it may have to be postponed *sine die*. The same may be said of the condensing or the purifying apparatus. Cases of this sort are becoming more and more rare every day, as the directors of gas companies are fully alive to the importance of having the whole of their plant in first-rate order according to the most modern ideas.

Perhaps it may be said that there are not many gas undertakings in which it is found advisable to restrict the consumption of only one kind of coal. A story has been circulated to the effect that a certain small provincial company used as many as 70 different sorts of coal in a year; the reason of this being that the manager gave a sample order to every coal agent's traveller who called, in the belief that he thus obtained some of the cream of the coal, sent on decidedly better than the bulk, with an eye to future business. But it is not likely that this system of doing business finds general favour. It certainly is not probable that even one undertaking in twenty will use one kind of coal exclusively during the whole period covered by a statement of accounts; but still there are a considerable number throughout the country which have done so at least once in a way. But, coming down from the yearly or half-yearly accounts, many gas engineers must have in their possession the records of carefully conducted experiments extending over weeks or months with particular kinds of coal. These, if collected and published in convenient form for reference, together with a brief description of the kind of apparatus used and the mode of working followed, would at once place the engineer in a position to exercise his judgment on the matter before him.

Mr. D. A. Graham, who is now Engineer of the Dunedin (N.Z.) Corporation Gas-Works, has shown, in the excellent series of articles on "The Valuation of Gas Coals" which appeared originally in Vols. XXIII., XXIV., and XXVI. of the JOURNAL, and which have since been published in book form, that when once the necessary data are given, as to the returns obtainable from any kind of coal, its value may be assessed according to any convenient basis, in respect to each and every item that goes to influence the value obtainable from it. A perusal of these articles, and of Mr. Graham's further communication in the last volume (p. 541), will show that in connection with this subject there is much that is not likely to attract the attention of those who have not carefully and thoroughly worked it out. But the utility of any arithmetical or geometrical plan for representing the value of a coal must obviously turn upon the accuracy of the data that are used as the starting points. Once right in regard to these, it is only a matter of skill and accuracy on the part of the investigator to work out the value of every sample according to one common basis, and thus to indicate the comparative value of each.

The George Livesey Testimonial Fund.—The Committee of the George Livesey Testimonial Fund have issued to the subscribers a circular setting forth the result of their appeal. It states that a sum of £2216 was received from 1450 subscribers, and that a balance of about £1750 will be handed over to Mr. Livesey for disposal in such way as he may think fit. At the request of many subscribers, Mr. Livesey was induced to waive his original objection to receiving a personal gift so far as to consent to having his portrait painted for the Board-room of his Company; and at the close of the proceedings at the half-yearly meeting to-morrow, an illuminated address, the portrait, and a cheque for the above amount will be presented to him. It has also been decided to tender a copy of the portrait to Mrs. Livesey.

"The Gas Consumers' Diary," of which a copy has reached us from the Blackfriars' Printers, Limited, is the outcome of an attempt on the part of "A Practical Gas Engineer" to enable consumers to take the indices of their meters, and keep a permanent record of the consumption of gas. The diary is arranged for a weekly reading of the index for twelve months, commencing at any date. On the left-hand pages are diagrams of the meter dials, without hands, the exact positions of which have to be marked when the weekly reading takes place. The opposite page is ruled in columns for entering the figures. At the end is a page for the four quarterly readings; and in this the total yearly consumption is shown. The tables are preceded by instructions as to the reading of the dials. The arrangement of the diary is, as far as we are aware, quite unique.

An Explanation.—When alluding, in the course of our comments last week on the proceedings at the recent half-yearly meeting of The Gaslight and Coke Company, to the doubts entertained by the Board as to whether they could legally recommend the full rate of dividend under the sliding scale for the first half of the present year, although the price of gas for the period in question would have justified it, we referred to the action taken by the Commercial Company a few years ago, and said that they had "actually paid an increased dividend for a half year, while the justifying reduction of the price of gas only operated for a single quarter." It has since been pointed out to us that these words are liable to misconstruction; and, therefore, we now state the exact circumstances under which the increased dividend was paid on the occasion mentioned. The price charged by the Company in the first quarter of 1886 was 2s. 8d. per 1000 cubic feet; justifying, under the sliding scale, a dividend of 13¼ per cent. On the 1st of April, a reduction of 2d. per 1000 cubic feet took place; giving the shareholders the right to an extra ¼ per cent. (or 13½) for the quarter ending in June. The Directors took the average price of gas over the half year—2s. 7d.—and on this recommended the dividend of 13½ per cent. (the mean between the 13¼ for the first, and the 13¾ for the second quarter), which was eventually declared.

COMMUNICATED ARTICLE.

THE PRESENT POSITION OF DISTRICT ASSOCIATIONS.

By Norton H. Humphrys, Assoc. M. Inst. C.E., F.C.S.

The remarks under the heading of "A Suggestion for District Associations" (see *ante*, p. 347) come very appropriately at the present time, when the position of these societies—which now, I believe, number about eight in the United Kingdom—is worthy of careful consideration. Some few members of these Associations regard the reading and discussion of papers as so much "bosh;" while at the same time they cordially support the local society, on account of the facilities it affords for social gatherings and conviviality at the meetings. But the original purpose of these meetings was to afford something beyond the enjoyments, of an excursion club. The reading and discussion of papers was, and is still, considered by the majority to be the main object for which the Association was formed. And so it is that the unfortunate persons who are responsible for the drawing up of the programmes are expected to hunt up, by hook or by crook, a sufficient supply of papers to occupy the time at the meetings. In addition, the whole of the proceedings at the eight Associations are common property, inasmuch as they are reported in our technical journals; and therefore a member of any one Association will probably be not only acquainted with the proceedings of his own, but also with those of the other seven. Under such circumstances, it is very difficult to provide a programme offering any attraction by way of originality or novelty to the members; for these eight Associations require a supply of something like forty papers and eight presidential addresses per annum.

Now it may be thought that local circumstances peculiar to any one Association would furnish a text for some of these discourses; so that each might occupy a part of its time with matters interesting to its members alone, and not appropriate to any other. But I do not find this to be the case; by far the greater number of papers read deal with general questions. The only exception appears to be in the case of Scotland, where cannel coal and 25 to 30 candle gas prevail. Papers referring to this kind of material and quality of gas are, of course, only appropriate to that district. As regards the other Associations, nine out of every ten papers read would fit in with equal propriety to the proceedings of any one of the seven. Take out the papers dealing with general subjects—such as main laying, unaccounted-for gas, retort-settings, &c.—and a very small residue will remain. It is the same with the presidential addresses. The majority of them are devoted to matters of a general nature pertaining to the gas industry at large, rather than to questions of a purely local kind. If we go back upon the fact that a description of novelties might well form part of the material for the preparation of papers, we fall foul of the current technical literature, which unearths and describes everything in this line immediately upon its appearance. Of course, a good deal remains to be said about personal experience with novel methods and processes that are introduced in connection with the gas industry; but, at a very liberal estimate, a dozen papers in the year would cover everything that is to be written under this head.

It is best to be perfectly candid on this matter. I do not enter upon the question of whether the reading and discussion of papers is an indispensable feature of Gas Managers' District Associations; but only deal with the fact that such is generally supposed to be the principal object of these meetings, and that there is a lack, not so much of persons able and willing to read papers, as of subjects to write papers about. There are some fifty papers produced annually, relative to the gas industry, and that from material not adequate to supply half the number, if freshness and originality are to be preserved in each case. Hence a certain amount of repetition on well-worn themes, of mere literary compilation, and other matters that tend to bring them into discredit as being tame and wanting in practical value, has appeared in some of our "papers" of the last year or two, and is no doubt responsible for the lack of interest in this department that has been markedly noticeable among a large part of the community at all gatherings of gas managers.

It is the more important to be quite clear upon this point, because there is a disposition to take the programme of the proceedings as an evidence of the standing and vitality of the Association. The general opinion appears to be, in the event of a meeting being held at which the papers are evidently of the nature of stop-gaps, or else conspicuous by their absence, either that the Association is in a bad way, or that the management is not so energetic as it might be. Assuming that the meetings are held half-yearly, and that two papers are required for each one, this arrangement includes the assumption, not only that there is a sufficient advancement among the members to supply the four papers a year, but also that there is enough novel matter available to form subjects for the papers to be prepared. It may therefore happen that the lack of papers is not due to want of ability or interest in the Association among the members, but simply to the fact that the subject-matter has been exhausted.

Our industry is not at a standstill, but, on the contrary, is progressing steadily; and many subjects worthy of discussion are continually forthcoming. All this is consistent with the fact that

an attempt is made to get too many "papers" relating to it in the course of a year. Consequently some of the papers, being written in order to oblige the Committee of Management rather than as containing matter likely to interest the Association, and in all probability put together somewhat hurriedly at the last moment, are really of no use except as a means of swelling out the transactions. Any shrewd visitor, accustomed to the proceedings at scientific meetings, would be able to detect the fact that they are really written in order to keep up the *appearance* of holding a meeting for discussion on technical topics. But would not the more dignified course be simply to announce to the members that no papers were forthcoming? Then the proceedings could take the form of a pleasure excursion or of a visit to some works of interest, or be omitted altogether as might seem best. There is no real necessity to hold meetings at stated periods if there is no *pabulum* for such a gathering. And it would be better to forego the meeting altogether than to go through the farce of holding it by the aid of papers that are merely repetitions on threadbare subjects, followed by discussions of a similar character.

Holding these views, which seem to gather weight with each succeeding meeting for which it is my lot to arrange the order of the programme, it is only natural that I should gladly look at any proposition for increasing the usefulness of District Associations; and therefore the present object is not so much to criticize as to welcome any suggestion for rendering such Associations more useful, not particularly to the world at large, but to the members who support them. There has always been a sort of vague idea that the headquarters of the Association might in some way be made the repository of knowledge or information likely to be useful to the members; but it has never taken practical shape. The notions of a lending library, of a laboratory stocked with useful kinds of apparatus—for instance, that used in gas analysis—that could be lent out to members to enable them to pursue a series of experiments, of a record of patents, legal cases, &c., likely to furnish particulars of precedents to those requiring them, not to mention many others, have been repeatedly put forward. But the notion of making the district secretary's office a centre for the collection of statistics respecting extensions at the gas-works represented on the roll call, is new to the writer. There can be no question but that the reading of such a list of particulars would afford useful occupation for a portion of the time at the meeting, especially if followed by free discussions. It might be illustrated by working drawings, or by including certain details which it might not be desirable to publish, and thus made the means of offering some inducement to those who decline to come to the district meetings, or perhaps go so far as to refuse to join the Association, on the plea that they can sit in the armchair at home and read all about the proceedings. The task of preparation might be allotted to an individual or to a small Committee appointed for the purpose of personally visiting the extensions; and this Committee should be a standing one, as the report would gather value year by year if prepared by experienced hands. Such a report might also be extended to include particulars of materials used and the yield obtained from them, cost of manufacture and purification, rates of wages, and a vast amount of useful statistical information that many would object to publish broadcast but would be willing to hand over for the benefit of their fellow-members. It is to be hoped that the question of adding to the usefulness of District Associations in this direction will not be allowed to fall to the ground, but be brought into operation before the dearth of fresh attractive papers shall have operated so far as to render the proceedings as now conducted, tame and uninteresting to the majority of the members.

The Glenboig Union Fire-Clay Company, Limited, of Glasgow, have just issued a new catalogue of their various specialities in fire-clay goods. It is neatly got up and of convenient size; and may be commended to the attention of all gas managers who contemplate making alterations in their retort-settings in view of the coming winter.

The Munich Gas and Water Works.—The thirtieth annual meeting of the German Association of Gas and Water Engineers, which recently took place in Munich, has been signalized by the production, as a memento of the event, of an elaborately got-up volume, containing a history and description of the gas and water works of the city, with illustrative plates and maps. By the courtesy of Dr. Schilling (Director of the Munich Gas-Works), we have been favoured with a copy. The first plate shows the works as they were in 1850; consisting of two retort-houses and three small holders, with the accessory buildings. From the second plate we are able to see how these works have grown in the forty years which have since passed. The manufacturing plant has been very largely extended; while the storeage has been increased by three additional holders—all nearly twice the diameter of the original vessels. In addition, entirely new works, shown on the third plate, have been constructed n another part of the city. There are six plates and plans relating to the water-works and the general canalization of the city. The letterpress description is interesting; and this and the plates have been most carefully executed—as would, indeed, be expected in the case of any work of this kind issued from the house of Oldenbourg. We hope to notice the contents of the book more fully in an early issue of the JOURNAL.

TECHNICAL RECORD.

NORTH OF IRELAND ASSOCIATION OF GAS MANAGERS.

The Third Annual Meeting of the North of Ireland Association of Gas Managers was held last Tuesday, in the Assembly Rooms, Newry. The PRESIDENT (Mr. Andrew Gibb, of Newry) occupied the chair; and there was a good attendance.

ANNUAL REPORT.

Some routine business having been transacted,

The SECRETARY (Mr. J. Whimster, of Armagh) read the Committee's annual report, which stated that a record of the work of the Association during the past year was necessarily of a very formal character, as the principal business before the last meeting was the consideration and discussion of several papers on matters of interest by members of the Association. The Committee regretted the loss the Association had sustained during the past year owing to the death of Mr. A. M'Kimmie, of Glasgow, one of their extraordinary members; but, on the other hand, they were glad to record that there was a growing interest in the work of the Association, as evidenced by the number of applications for membership—six for ordinary membership, and two for extraordinary membership—which were to be submitted to the meeting. The Committee at the same time desired to strongly impress upon the members that if the Association was to be increasingly successful and useful, it would be necessary for every individual member to put his shoulder to the wheel, and not to leave the work to a few of the members. From the financial statement, it appeared that at the end of the year's work there was a balance to the credit of the Association of £6 13s. 4d. The Committee, in conclusion, reported that, in accordance with Rules 25 and 26, three members of Committee (Messrs. Ross, Frizelle, and Stears) retired by rotation, and were ineligible for immediate re-election.

On the motion of Mr. R. MERRILEES (Castleblayney), seconded by Mr. M. MARTIN (Drogheda), the report was adopted.

ELECTION OF NEW MEMBERS.

The PRESIDENT said the next business was the election of new members, which was a very important matter. As the report stated, it was an indication of the success of the Association to find applications for membership coming in.

The following gentlemen were then elected—As ordinary members: Messrs. J. M'Laren, of Warrenpoint, E. Grant, of Athy, J. Todd, of Limavady, W. J. Wynne, of Ennis, George Donaldson, of Waterford, F. J. Clarke, of Ballinasloe, P. J. Salmon, of Galway, and J. Kirkham, of New Ross. As extraordinary members: Messrs. John Bain, of Glasgow, Alex. Smellie, of Glasgow, and H. Shimeld, of Oldham.

ELECTION OF OFFICE-BEARERS.

The SECRETARY said that the Committee had given the subject of the election of officers their very careful consideration; and they recommended to the members that they should elect Mr. R. Ross, of Dungannon, as President for the ensuing year. The Committee also thought that it would be advisable at this meeting to begin with having a Vice-President as well, as provided for in the rules. They had hitherto done without a Vice-President, because their numbers were small; but the Committee thought it would be better that the position should now be filled, with a view to the presidency in the succeeding year. Mr. D. M'Callum, of Omagh, was suggested as a suitable gentleman for the office. These were the recommendations of the Committee; but, of course, the matter lay in the hands of the members who could receive or reject them as they thought fit. He would, however, propose that the Committee's recommendations be adopted.

Mr. W. B. FEATHERSTONE (Dundalk) said it would give him much pleasure to second the motion, because he believed that Mr. Ross and Mr. M'Callum were well fitted for the positions in which it was intended to place them, and would discharge the duties both with credit to themselves and advantage to the Association.

The proposition was passed unanimously.

The SECRETARY next moved that Messrs. M. Martin, of Drogheda, D. Williamson, of Ballebay, and C. B. Outon, of Inchicore, should be elected to fill the three vacancies upon the Committee.

Mr. FEATHERSTONE seconded the motion, which was carried.

Mr. Ross said he desired, before passing on to the consideration of the next business, to tender his hearty thanks to the members of the Association for the honour they had done him in selecting him for the office of President for the coming year.

The PRESIDENT then proceeded to read the following

INAUGURAL ADDRESS.

Gentlemen,—Let me now return grateful thanks to you, as members of our Association, for the high honour conferred in electing me your President. I trust your interests have not suffered during my term of office. I assure you my highest desire is to do what I can to further its interests. I cannot on this, our third annual gathering, advance anything new or exciting; but I will now place before you a few homely thoughts by way of an Address.

When Queen Dido sat with Cupid in her lap in the spacious hall in her house in Carthage, shining lamps depended from the gilded roofs; showing that man, in all ages of the world, has

resorted to artificial light to wile away the time of darkness. The quality of the occupant determined the elaborateness or the simplicity of the supply of that great want. What a contrast from the "rozin slut" to the grand incandescent burners of these days! Yet how slow has been the progress; almost within the memory of the present generation has this progressive innovation been made. Contrast our good King Alfred, with his candles marked in divers colours, and of different lengths, to mark the progress of time and give illumination, with those appliances that the student of the present can enjoy with all the comforts and ease of our day, and one can see what time and ingenuity have done for the world.

Great as is the progress developed in some branches of illuminators, the makers of gas-fittings have not kept up with the march of improvements. In every warehouse in the three kingdoms you will see the stereotyped pendant and bracket—some attempt at ornamentation, but little improvement for giving a better supply. Just look at the supply-pipe at some of our water pendants. See the look of disappointment on the face of the consumer, who raises the oft-reiterated cry, "The gas is bad," while in reality the fault is in the instrument itself. Read that recent case in Cork, and learn a lesson from it. Gas managers ought to advise consumers of gas to select the best if they wish comfort, not the cheap, flashy, trashy article.

The year has not been altogether barren of progress in matters which interest mechanics, and gas managers in particular. Witness that grand achievement, the erection of the Forth Bridge. The construction of girders and the other principles there illustrated are full of interest to us all. I can only refer you, for full details, to the special issue of *Engineering*, where you can read and be satisfied.

Gasholder construction has received an impetus in a direction different to former ways and plans. Messrs. Gadd and Mason have successfully erected in Northwich a gasholder on their plan, and so far have achieved a triumph—all accounts bearing testimony to its steadiness and safety. Mr. Pease has also succeeded in his new mode of raising and lowering gasholders without the display of columns, girders, and other previous appliances. No doubt newer and loftier conceptions are formed as to the application of mechanics, to obtain stability and safety in erection and working out, than were conceived by our predecessors. Mr. George Livesey's three-lift gasholder, without stays on the third lift, was the precursor of these great advances of science.

If we wish to keep ahead of our business, we must read; and read the proper reading. Some publications ought to be on our table for reference and study; and first of these is "Newbigging's Gas Manager's Handbook" (Fifth Edition). It is a book replete with information on every department of our work; data, true and reliable, available at a moment's notice; information varied and useful on every subject, and fully and carefully expressed—truly a *multum in parvo*. Mr. Dibdin's work on "Photometry," not so fascinating as the previous publication, is nevertheless a valuable addition to the library of the gas manager; and one that will well repay the time and trouble of reading. And last, though not least, those volumes, being the collected papers and transactions of all the Gas Managers' Associations (except The Gas Institute) in the three kingdoms over, where you will find the gist and brainwork of your fellow-students, garnished and served up in every diversity of subject and style, calculated to improve and better fit for the tug of war. Our own Association's work presents no unimportant appearance in the last two volumes. Many other works might be pointed out; but these will suffice to indicate a course of reading profitable and agreeable, during the leisure time at our disposal.

Water gas has its times of sunshine and of sorrow; its lights and shades. Sometimes it appears like a great monster, ready to devour any process of production of gas that would oppose it; at other times, it has been obliged to hide its diminished head, and recede from view for a time, and then flash across the horizon, demanding additional payments from its shareholders, but not, so far as I have seen, giving them any dividends in return. These pleasures—

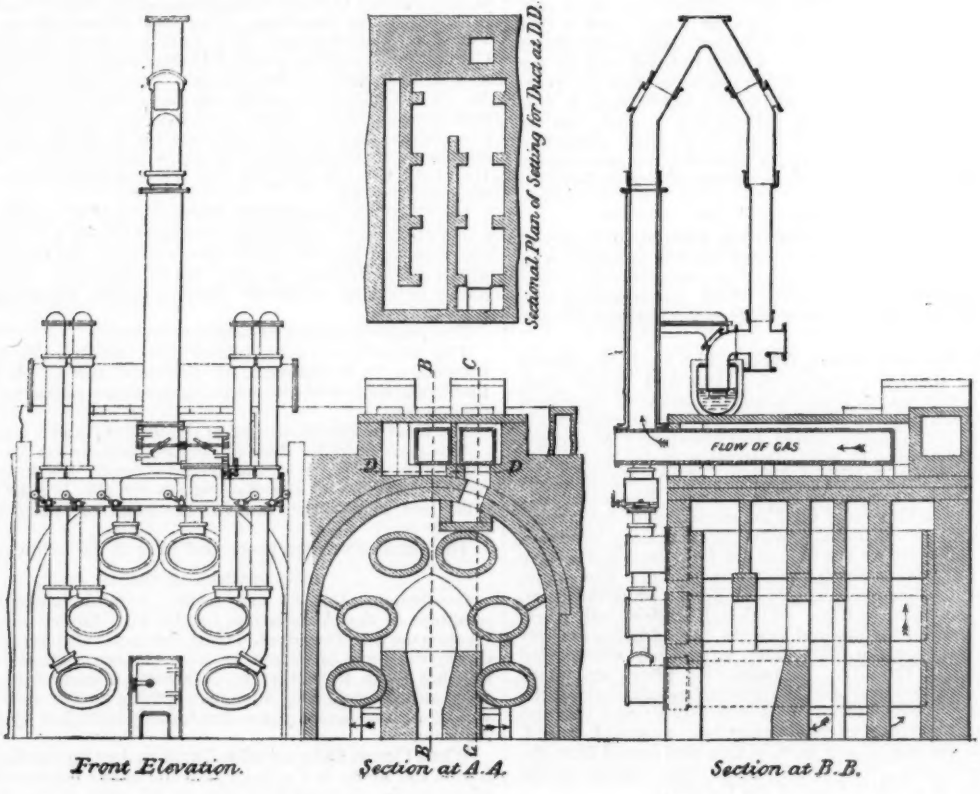
> "Are like poppies spread,
> You seize the flower, its bloom is dead;
> Or like a snowdrop in the river,
> A moment white, then lost for ever."

But to descend from the ideal to the practical is not so easy. The great proportion of carbonic oxide is the *bête noire* of water gas. Could this be replaced with hydrogen, it would be a good thing. Common water gas is not a good carrier of the hydrocarbon gases. Just fancy 320 lbs. of soda lime being required to purify 1000 cubic feet of water gas. Dealing with 100,000 cubic feet of this water gas, it would require 15 tons of soda lime per day; and this material would then require to be made red hot, washed, mixed, replaced, and removed each day. Contrast this with coal gas manufacture; and draw your own conclusions.

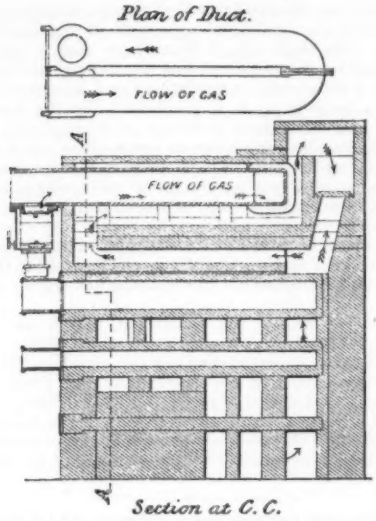
A paper was read on the subject of Loomis water gas at the meeting of the Institution of Mechanical Engineers, held at Sheffield a few days ago.* It produces three kinds of gas: (1) A generator gas; (2) water gas for fuel; (3) carburetted water gas for lighting. "The water gas from this process differs from any other water gas in its peculiar and strong odour, in consequence of which any leaks are readily detected; and it burns with a flame equal to 4 to 10 candle power." So said Mr. R. N. Oakman, jun. A saving of 75 per cent. in heating power is claimed; but Mr. Hoyle says 50 per cent. would be nearer the mark. Sir Lothian Bell, speaking on the paper, as reported in the *Engineer*, Aug. 1, says, he would lay it down as an axiom "that on the matter of obtaining the greatest heat from a given amount of coal, to burn it as solid fuel was the best, to convert it into producer gas was the next best, while worst of all was to waste the heat of a large quantity of coal in the production of hydrogen gas."

I had expected a paper from one of our members giving his experience of the Dinsmore process of manufacturing gas; but circumstances prevent our enjoyment of such a communication. I have here a drawing of the whole apparatus, kindly lent by

* See JOURNAL for the 5th inst., p. 294.



Front Elevation. *Section at A.A.* *Section at B.B.*



the Dinsmore Company for our inspection. The Dinsmore mode of working seems on the increase. I see it is being tried at various works. These trials will bring to the front the value it possesses. I cannot do better than refer the members to the paper read by Mr. Isaac Carr, on Nov. 30, 1889, with the discussion thereon.*

Two or three different arrangements of inclined retorts are before the world at present. They all have the one object in view—the supply and discharge of coal into the retort without so much manual labour as has hitherto been required. These retorts are set at an angle of about 40° or so. Mr. G. C. Trewby, of The Gaslight and Coke Company, is erecting sixteen settings of nine retorts, being 144 retorts, on this principle. We must await results ere we presume to give judgment.

Claus's system of gas purification in closed vessels has been tried on an extensive scale at the Belfast Gas-Works with very satisfactory results. Such practical experiments are interesting and instructive, as by thus putting ideas to the test, their validity or genuineness may be illustrated, and the cost of such systems readily ascertained. I cannot give you any figures; but I doubt not that at some future meeting these will be available for the members.

If prepayment gas-meters are found in every circumstance to be reliable, and not liable to be tampered with, I take them as an omen for good to gas companies. An experiment of an interesting character has been carried out at Ramsgate. There, the Gas Department in their last report showed an increase of 10 per cent. over the make of the previous year. They say this is largely due to the introduction of the prepayment gas-meter. In June, 1889, there were 22 consumers, and 250 during the six months. The average consumption of each consumer was 6000 cubic feet for the half year, or 12,000 cubic feet per annum. The charge is 4½d. per 100 cubic feet; being 7d. more per 1000 cubic feet than ordinary consumers—to pay for the extra outlay for fittings and the meter. The average cost of fitting up each house was £4; and as the average consumption is 12,000 cubic feet, the Corporation receive 7s.; part of this sum being absorbed by the payment of interest on the capital expended, and the balance being carried to a fund which will eventually repay the capital itself.

The recent borings in Kent have revealed the fact that there is coal there; but before we can say whether or not the field is large and good, more information is wanted. Should it prove a success, it will have a beneficial effect on that portion of the kingdom. Professor Boyd Dawkins, at the Royal Institution a few weeks ago, lecturing on the search for coal in the South-East of England, said: "Following the line of prediction laid down by Mr. Goodwin-Austin in 1855 at the Geological Society, and in 1858 at the Royal Institution, and confirmed by subsequent researches, he pointed out the probability of coal being found in isolated basins along the axis extending from the Mendips through France into Westphalia; the coal strata at the Dover boring being, he said, in all likelihood continuous, or nearly so, with the coal found at Calais, and extensively worked at Marquise."

I have been long and anxiously expecting to see and read the result of the Deptford installation of electricity. This centre is, I understand, fitted up with all the newest appliances for the generation and transmission of the fluid. Great expectations are held out as to its results. We must, however, wait for its inception. There is no need for rivalry between electricity and gas. The cost will soon settle all the difference for the consumer, unless he cares not for cost, but the £ *s. d.* puts all practical results to the test. Mr. Denny Lane, of Cork, puts the whole matter of cost into a few lines. Taking the Board of Trade unit at 8d., and gas at 3s. per 1000 cubic feet, he says:

"Let us see the cost of electric lighting under the circumstances; for a 16-candle lamp takes 16 × 5¼ = 84 watts per hour. As 84 watts multiplied by 2000 hours is equal to 168,000 watts, we require 108 Board of Trade units in the year; and these at 8d. per unit cost 72s. To this we must add the cost of two lamps, 8s., with proportion of hire of meter, transformer, fuse (say, 2s. per annum)—total cost £4 2s. On the other hand, let us see what would be the cost if we use 16-candle gas at 3s. per 1000 cubic feet. As before, we want 16 × 2000, equal 32,000-candle power; and as each cubic foot gives 3·2 candles, we require 10,000 cubic feet. Our expenditure would, therefore, be 1000 × 3s., equal to £1 10s. as compared with £4 2s. In other words, the electric light at 8d. per unit would cost 173 per cent. more than 16-candle gas at 3s. per 1000 cubic feet. So far, therefore, the difference in cost between electricity and gas is so great that on this score we need have no fear; but it becomes every gas manager to bestir himself, and not rest satisfied with what has been done, but strive to do better in the near future.

I approach consideration of the labour question with fear and trembling. The atmosphere is full of strikes, with their attendant evils to capital and labour. The working man is entitled to fair and considerate renumeration for his expenditure of labour. The capitalist also has his claims for consideration, because were he not there, where would wages be? They could not exist. It is a great pity when itinerating discontent is allowed to find a lodgment in any town or any department of labour. The employer and employed ought to be allowed to settle their differences themselves, and in ninety-nine out of every hundred cases there would be peace and plenty among the community. See the squalid face and tattered garments of the poor, often caused by giving too ready an ear to the siren tongue of the intruder. A fair field and no favour, with a desire to live and let live, are the comfortable conditions of all.

In conclusion, if progress is to be measured by the abundance of papers produced, our progress as an Association has not been great. I know our esteemed Secretary has been indefatigable in his exertions to obtain papers, and failed—not through any fault of his own, but from the listlessness, lukewarmness, and want of energy on the part of the members. You will have papers on two important subjects—"Retort-Setting" and "Furnaces"—both of which I trust will give rise to hearty discussion. Let none fear to hear his own voice, and give the members the benefit of his experience. If you wish this Association to go ahead and prosper, you must individually put your shoulder to the wheel; and when a good push, a long push, and a push all together takes place, you may expect progress, but not when you stand aloof, and wait to see who will volunteer.

Reading of Papers.

The President said they had now approached the most interesting portion of their proceedings—the reading of the papers. The papers dealt with matters of vital importance to gas managers; and he hoped the members would show their interest in the subjects by freely discussing them, and that they would, by giving expression to their own personal experiences, help one another as much as possible.

Mr. M. Martin (Drogheda) was first called upon to read his paper on "Retort-Settings;" and after a conversational discussion, he was followed by Mr. W. B. Featherstone (Dundalk), with one entitled "Notes upon Retort-Furnaces." Pressure on our space to-day compels the holding over of our report of this part of the proceedings till next week.

The Title of the Association.

The President remarked that, at the last annual meeting, the question of the proposed change in the title of the Association was remitted to the Committee; and he would now ask the Secretary to read the report on the subject.

The Secretary read the report of the Committee, which was as follows:—

Your Committee, having had remitted to them at the last annual meeting to consider and report to this meeting upon the desirability or otherwise of changing the title of the Association, so as to give it a national character, beg to submit the following report:

They consider this remit as evidence that if such a change were generally desired by the gas managers of Ireland, the present members were quite willing to agree thereto. Such a change would completely alter the character of the Association. Being national in its title, its meetings could not be confined to one district, and its Committee would require to be representative of all districts. These would both be serious obstacles; as if a member of Committee wished to do his duty, it would put him to very considerable expense, and perhaps inconvenience, to attend Committee meetings that would be equi-distant from all; and the annual meetings having to be distributed over the country, would be practically closed against the managers of small gas-works in any other district than that in which the meeting was held. So that for them, instead of being an annual meeting, it would only be available for them when held in their own district. On the other hand, the Committee are conscious that for this very reason their brethren in the South and West are practically excluded from the Association as at present constituted. This, of course, cannot so far be regarded as a reproach; as the Association was distinctly founded as a District Association. But having been joined as such by a few members quite outside the district, and having had it intimated by one or two others that this limitation prevented them from joining, which they would be willing to do were this objection removed, the Committee are of opinion that the Association would certainly be open to the charge of selfishness and exclusiveness if they refused to consider the wants of their brethren in other parts of the country.

In order to ascertain the wishes of the general body of gas managers in Ireland with respect to the matter, the Secretary issued a circular to the manager of every gas-works in Ireland of which he could find any record

* See Journal, Vol. LIV., pp. 1060, 1105.

enclosing a form of reply, addressed and ready for a halfpenny stamp. These were sent to the present members as well, seeing that the change would materially affect them by adding to the time and expense involved in attending the annual meetings; and the Committee thought it but right they should have the privilege, if they wished, of objecting to the change, as well as others had the privilege of indicating their desire for it.

The following is a summarized report of the analysis of the replies received: Circulars issued, 118; replies received, 32; present members who would continue if title be altered, 16; present members opposed to change, 5; non-members who would join if title be altered, but not otherwise, 5; non-members who would not join any Association, 1.

Of the circulars to which no reply has been received, twenty-two were sent to those who are already members of the Association, and who may be presumed to be indifferent as to whether any change takes place or not. Of the present members who have replied, a number would prefer that no change should be made, but would not stand in the way of it if it were proved to be for the general good. One gentleman also, who says he will join if the title be changed, but not otherwise, says that he sees no need for an Association in Ireland, as those in the South can go to The Gas Institute, and those in the North to the North British Association of Gas Managers. It would seem, therefore, that of all the gas managers in Ireland not more than half take sufficient interest in such a scheme as to return a printed circular at the cost of a halfpenny stamp.

With these results before them, the Committee cannot see their way to recommend any change of title. If the title be changed, we should gain five new members; but we shall lose five present members, so it would seem that to continue as we are at present will conduce to the greatest good of the greatest number. Had there been a greater interest in the matter apparent one way or the other, the Committee think that one or two similar District Associations might have been instituted with advantage; and a united meeting of all held once in three or four years in Dublin or some other central place. The Committee, therefore, recommend that no change should take place in the title of the Association, that a warm welcome should be offered to all, and that the Association should endeavour to forward and advance the interests of all connected with it.

Mr. WILLIAMSON moved the adoption of the report.

Mr. J. NISBETT (Portadown), said that as the proposer of the existing title of the Association, he would second the motion. He did not think there was any necessity whatever for a change in the title.

Mr. MARTIN thought there would be no harm if a change were made, as it might be an inducement to some to join who now stayed away because the name was objectionable.

Mr. ROSS said that from the report it appeared that the change would not result in any accession to their numbers.

Mr. FEATHERSTONE remarked that it seemed to him like giving away five birds in the hand, in order to catch five in the wood. (Laughter.) He did not think they should give up five of their own members, in order to get an equal number of outsiders. He could not see the advantage of such a course of action; and he agreed with the Committee that no change should be made.

Mr. WILLIAMSON considered the result from the circulars was very disappointing. It showed there was very little interest taken in the matter.

The SECRETARY said the Committee at one time thought there was a disposition on the part of their brethren in the south to amalgamate with them, and form one large national Association; but the result of their efforts to bring this about were very discouraging.

Mr. WILLIAMSON said the circular sent out at the founding of the Association was disheartening enough; but it was not so bad as the one just sent out by the Committee. The former, however, was confined to a district.

The SECRETARY said they then drew a line from Dublin to Galway, and took in all north of the line. The replies received were not so numerous as they could have wished; but the result was better than in the case of the last circular. Of course, in deciding not to change the name of the Association, they were not taking a permanent step. They were merely deciding that for the present the name should remain as it existed. Of course, the matter could be considered at some future time; and if they were ripe for a change, it could be then effected.

Mr. WILLIAMSON said that in the meantime they would hold out the right hand of fellowship to all brethren who liked to join their ranks.

The resolution was unanimously passed.

THE NEXT MEETING OF THE ASSOCIATION.

Mr. ROSS, in proposing that the next annual meeting be held in Dungannon, observed that he would give the members a hearty welcome there.

Mr. MEARNS suggested that they should meet next year in Belfast.

Mr. STORMONTH agreed that it would be much better to meet in a central place like Belfast which was accessible to all.

A vote was taken; and it was decided to hold the meeting in Belfast, on the second Tuesday in August next year.

RE-ELECTION OF THE SECRETARY.

The PRESIDENT proposed the re-appointment of Mr. Whimster as Secretary of the Association, and coupled with the proposition a very hearty vote of thanks to him for his invaluable services since its establishment. He never knew there was so much trouble in connection with the office until this year; and with the experience he had had of the anxiety and energy of Mr. Whimster in connection with his work, he could assure the members that that gentleman deserved their gratitude.

Mr. STORMONTH, in seconding the resolution, said that it was quite evident, if it were not for the ability and energy of their worthy Secretary, the Association would not now be in the splendid position which it occupied.

The resolution was passed by acclamation.

The SECRETARY returned his best thanks to the members for their very kind expression of approval of his services to the Association. He must admit that there was a great deal of work attached to the position; but he did not mind it, as long as they had a flourishing Association, and successful meetings. He hoped to be able to do a great deal for the Association in the future; and he trusted it would be increasingly successful. In time, however, he would expect some other gentleman would take his place and relieve him of the duties. In conclusion, he thought they should not part without recognizing, in a proper manner, the ability and energy of their worthy President; and he therefore had pleasure in moving that a very cordial vote of thanks be passed to him for the dignified manner in which he had conducted the business of the meeting, and for the valuable services he had rendered to the Association during his term of office.

Mr. STEARS seconded the resolution, which was passed by acclamation.

The PRESIDENT sincerely thanked the members for the hearty vote of thanks they had accorded him, and assured them he was only too glad to be able to do anything in his power for the welfare and advancement of the interests of the Association.

This terminated the business portion of the proceedings.

Subsequently the members dined together at the Imperial Hotel.

RETORTS CONTRACTED AT THE BACK END.

A Paper read by Mr. J. B. Terrace, of Brechin, at the Annual Meeting of the North British Association of Gas Managers.

When I introduced this subject to your notice some time ago, at an informal meeting in Glasgow, many of your number did not have an opportunity of taking part in the discussion. I therefore consider it my duty to bring it forward on the present occasion, with the hope that it will receive your united attention; and it will be my endeavour to lay before you my experience in the cleaning or scurfing of an ordinary retort in comparison with that of the improved shape I have adopted.

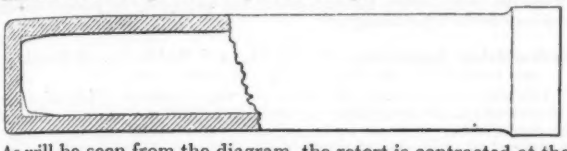
The works in which I have been engaged for the past six years were remodelled from plans prepared by the late Mr. John Reid, of Leith; and they contain a single retort-bench of six ovens, with four Ω-shaped retorts, 22 in. by 14 in., and 9 ft. long, in each. The cleaning of our retorts had been looked upon as a very difficult and troublesome operation, until about three years ago I determined to make a trial of the retort contracted at the back end. For this purpose I ordered four, and had them built into separate ovens, so as to enable me to compare them better working alongside the ordinary retorts; because if I had placed all four in one oven, it would have been possible to give them special attention. I had two of the retorts placed in the lower bed, and two set as top retorts, in separate ovens, as mentioned above, because, whether with the ordinary or the improved shape, the lower retorts are always more easily cleaned than the top ones. I may mention here that new retorts also are easier to clean the first time than on any succeeding occasion. When we were under the necessity of spending from 12 to 15 hours trying to clean an oven of four retorts, it need not be wondered at that some attempt should be made to simplify matters, and reduce to a minimum the hard work the men had to perform.

In preparing to clean our retorts, we close the furnace damper of the oven, remove the coke, and replace the lid so as to keep it about half an inch clear of the mouthpiece, to admit cold air at the bottom and allow the exit of hot air at the top opening for from 24 to 30 hours, as required. During the interval, the furnace fire is kept burning, so as to maintain a regular heat on the oven. Great care is exercised to see that no loose portion of the retort falls out, as often occurs with retorts which have been a long time in use and are slightly damaged; for should furnace air pass through the retort, it will be cooled rapidly and damaged, should the defect not be noticed and repaired at once. In cleaning, we employ long steel chisel-bars of $1\frac{3}{8}$ inches diameter, 17 feet long; and in the case of the ordinary retorts we endeavour to cut the cake or shell of carbon at the back into two or more parts. Should this operation prove unsuccessful, the carbon is often chiselled off in very small pieces. But even by this process it cannot be removed from some of the corners, as the surface of the carbon becomes smooth and bevelled, so that no chisel-bar can remove it without the use of some kind of bracket placed inside the retort, so as to prevent the point of the chisel sliding along without cutting; and in this position we can apply the sledge-hammer with success. But however careful our men were in using the chisel-bar, it was no uncommon thing to have some part of a retort broken at one stage or another. I consider it is best to charge each retort, as it is finished, with splint coal, and allow the heats to come up and the cracks to get filled in.

I should have preferred to clean our retorts every four or five weeks, taking one oven each week, when the carbon deposit was about 3 inches thick; but it was often impossible to do this, as our holder accommodation is inadequate, and we cannot keep an oven standing the requisite time in the winter season. Our cleaning therefore had to stand over for six or seven weeks, when the thickness of the carbon would have increased to about 5 inches. In some sets of retorts, the carbon is very irregular. An oven of four single retorts will have an excess; another

will have little or none; while the other three will have about the usual quantity. Again some ovens will deposit carbon more quickly than others; and at times some will work much longer than usual.

It will be understood that the ordinary retort is made with a flat back end, at right angles to the body of retort; and as the carbon is deposited at the back, it is very difficult to get it to free itself. In fact, one would think it had been deposited there never to be taken out. The new form of retort also has its back end at right angles to the body, except where it is a little slanted so as to prevent any coke being left in when drawing.



As will be seen from the diagram, the retort is contracted at the back end, forming a somewhat obtuse angle; consequently, the carbon, when it is deposited at the back, has some chance of freeing itself, and its even shape looks as if it was intended to remove any carbon which did accumulate.

Some gas managers, whether by force of habit or otherwise, continue to renew their retorts annually; and with regard to cleaning, I am sure many cannot, or do not, clean their retorts as often as should be done. If this improved shape were once adopted, much trouble and expense would be saved. It is not only more easily cleaned, but, with anything like good management, the deposit of carbon will not amount to 3 inches in eight weeks. When the coke-drawing "clat" is kept at its proper size, it will rub up against the inclined surfaces formed all round the back end of the retort, and keep the loose carbon from accumulating to the usual extent, as it is partially cleaned every time the coke is drawn. The cleaning of retorts, also, will no longer remain a troublesome and costly operation, as it will only be necessary to expend a tenth part of the time generally required for this operation, as the carbon deposited is less by 50 per cent., and the time occupied reduced to a minimum; and should any portion of the retorts become broken, some other cause than the cleaning chisel-bar will have to be looked for.

The Quality of the Rotterdam Water.—In 1887 the water supply of Rotterdam became so much infested with plants and animals that a Committee of Investigation was appointed, and new filters and other works were built. Dr. F. Dupont and Professor Hugo de Vries studied the growths by means of laboratories arranged at the water-works, and found that the *Crenothrix Kuehniana* was the chief cause of the trouble. This organism had previously been found to be the chief difficulty in connection with the water troubles of Berlin in 1878.

The Schulke Gas-Lamp.—The Schülke Gas-Lamp Company have taken new and commodious offices at No. 20, High Holborn; and have there a good assortment of their lamps fitted up for inspection. Since the introduction of the lamp, step by step, many improvements have been made; and these are very apparent when a specimen of the old and new forms are placed in juxtaposition, and put into operation. The external appearance of the lamp is much more pleasing to the eye. The body and chimney were originally made of three pieces of mild steel jointed together, or of solid china. The lamps made in these styles were heavy and clumsy looking. The new lamps are manufactured of mild steel in one piece; and are extremely light. They are enamelled; and some are embellished in a very pretty manner. With regard to the internal improvements, in the old arrangement the reflector ring was held in its place by three small wire hooks, which were a source of great trouble by their becoming oxidized and giving way. Then flat brass hooks were tried; but these likewise were found not to answer, owing to the difficulty of putting in a new one when required. The clips are now cast on to the body ring in one piece; and small slots are made in the reflector ring, so that they can be readily placed in position. The old nickel cone and clay ring have been discarded; and the whole interior is now made in one piece of refractory clay and asbestos, which while cheapening the cost of production makes the lamp lighter and practically indestructible. Besides this the chimney has been shortened; as have also the parts between the gas-tap and the globe. Various alterations have also been made to facilitate the lighting of the lamp. Some people have objected to the bye-pass arrangement, as they prefer to turn the gas supply off at the meter during the night; and unless the lamp was lighted (which was not so easy to accomplish as now) directly the gas was turned on in the morning, there was a slight escape of gas. To obviate this, a small aperture (covered by a flap) is now made on the stem of the lamp. By simply raising the flap and applying a light, the burners are immediately lighted by means of a small flash jet. The closing of the flap puts out the flash jet, and increases the supply of gas to the burners. There is one other improvement worthy of notice. The whole of the top portion of the lamp is fitted on to a sliding bar, which can be raised, and the globe removed for cleaning, without disturbing any other part. It is claimed that the improved lamp gives a higher duty for the gas consumed than did the old pattern.

REGISTER OF PATENTS.

Generating Gas from Combustible Liquids.—Dheyne, of Schaerbeck, and De Nydprück, V., and De la Hault, F., of Brussels. No. 11,459; July 17, 1889. [8d.]

The apparatus for generating gas or vapour from combustible liquids according to this invention is provided with a tank or receptacle from which the liquid is caused to flow through a pipe provided with a regulating valve to a coil or worm, in which it is converted into gas or vapour. The coil is arranged in contact with a metal surface or tube, and placed above a trough or vessel, within which, for the purpose of starting the apparatus, combustible liquid is burnt. The gas or vapour generated by the heat of this combustion is ignited at the end of the pipe forming the coil; and the flame heats the latter up to a temperature which can be regulated by a cock or valve controlling the escape of gas from the coil. The rate at which the vapour is generated being naturally dependent on this temperature, the action is automatically regulated; the quantity of vapour produced being always equal to the quantity consumed.

The invention embraces the combination with the generating coil tank tube and trough of a platinum vessel, acting as an igniter, arranged at the end of a cylinder of a vapour engine or motor, and a second coil communicating with the same liquid tank supplied with compressed air by a pump or by the action of the engine piston. Also the combination of the coil tube and trough with a liquid tank, provided with an elastic plate for applying adjustable pressure to the contents of the tank and a cock for regulating the supply of liquid from the tank to the coil. This arrangement is suitable for generating gas or vapour for lamps employed in soldering or enamelling operations. According to another arrangement, a flat spiral is substituted for the coil and tube, combined with a wire gauze or perforated metal sheet; the liquid tank being placed at a higher level to, and communicating with, the spiral, and one end of the pipe forming the spiral being extended downwards in the direction of a trough at the lower part of the apparatus. This plan is suitable for generating gas or vapour for cooking or other heating purposes.

Giving Notice of Leakage from Gas-Pipes.—Exupère, P. A. L., of Paris. No. 12,099; July 30, 1889. [8d.]

This invention relates to apparatus for giving notice, by an audible signal, of the leakage or escape of gas from pipes or burners after the gas is turned off at the meter or main. With this object a box or chamber is employed with flexible or elastic sides, placed in communication with the gas-pipes in such a manner that the sides move in response to any fluctuation or reduction in the pressure of the gas, and bring into action electric or other mechanism which rings a bell, or otherwise gives notice of the reduction of the pressure resulting from leakage or from an escape of gas through (say) a burner which may have been accidentally left open.

In the construction of the apparatus, a flexible chamber is provided of circular form, with one or both sides made of thin corrugated metal. One side of the chamber is attached to a hollow support, through which gas is conducted to the interior of the chamber by a nozzle, provided with a contracted opening so as to prevent any rapid inrush of gas on the sudden opening or closing of the cocks. This nozzle may also act as a stop, limiting the inward movement of the free or moveable side of the chamber. This side of the chamber is provided at its centre with a flat plate, which, when there is no pressure of gas in the apparatus, bears against a stop such as the above-mentioned nozzle. At the side of the chamber there is suspended a carefully balanced lever, provided with a screw by means of which it can be adjusted relatively to the flexible side of the chamber; and at the side of the lever there is suspended a second lever similarly balanced and provided at its extremity with an adjustable plate or arm carrying two pins, one of which is made of non-conducting material. The second lever is electrically insulated from the support; and the two pins are situated one on each side of the first lever—the adjustable plate enabling the amount of play of the lever between the pins being regulated according to the amount of sensitiveness required in the instrument. Springs are provided which tend to retain both levers in the normal or zero position when there is no pressure in the chamber. The chamber is emptied or relieved of pressure by a three-way cock, which when in one position places the chamber in communication with the gas-pipe, and in another position places it in communication with the atmosphere. The plug of the cock may also be provided with an eccentric cam or projection which operates a spring or other contact-maker, and disconnects the instrument from the battery when the gas is cut off from the chamber.

The apparatus being placed near the meter (for example) or between the main cock or valve and the burners, automatically gives a signal when the pressure falls below a certain limit, depending on the adjustment of the instrument. For this purpose, the three-way cock must be turned so as to admit the gas to the flexible chamber, which, expanding under the pressure, causes the first lever to oscillate and come in contact with the insulating pin on the second lever. The circuit of a battery or other source of electricity connected to the first lever through the contact-maker and the support, is thus opened; and the alarm apparatus is held out of action. But in case the pressure diminishes (owing to leakage, accidental opening of a burner, or other cause), the side of the chamber returns towards its original position and the first lever immediately, or after an interval dependent on adjustment, comes in contact with the conducting pin on the second lever, and by thus closing the circuit of the battery, brings the signalling apparatus into action.

Regenerative Gas-Lamps.—Thompson, W. P.; communicated from F. Stellwag, of Berlin. No. 14,149; Sept. 7, 1889. [8d.]

According to this invention in regenerative gas-lamps, the inverted flame from the mouth of the annular burner enters a circular chimney, approximately concentric therewith, and the under end of which is made of fire-proof material. The air entering at the sides of the lamp goes successively into three compartments, in order that it may be

heated; and it then passes through an annular-shaped chamber surrounding the burner, and thence to the flame. The gas enters directly into the upper tubular or annular part of the burner, whence it is conducted to the flame at the lower end. The products of combustion escape, through the central chimney, upwards. The burner is composed of two annular parts joined together one within the other; and the gas issuing from the exit end of the supply-pipe, travels through a space whose sectional area continually increases from the exit of a burner aperture. As the cross-section of the space at the upper end of the burner is larger than that of the supply-pipe, and as the cross-sectional area of the annular burner orifice is larger still, it results that the passage for the gas on its way to the flame becomes constantly larger, to an extent corresponding to the constantly increasing heat of the gas and to its increasing volume. Thus a constant speed of the gas is obtained and its compression is avoided. The arrangement of three compartments for heating the air has for its object: (1) The utilization to a great extent of the heat produced by the lamp; and (2) the prevention of the entrance of cold air to the under part of the chimney or to the flame—which often happens if a door is smartly closed—and the consequent avoiding of a smoky flame.

The invention is also applicable to regenerative gas-lamps in which the inverted flame curves outwards from the centre, over an annular deflecting disc, instead of inwards towards the centre as in the preceding case. The products of combustion here pass up through an annular space above the disc and into the central chimney. The air enters between the bottom of the lamp proper and the lower edge of an outer casing surrounding the lamp, into an annular compartment within the casing, up which it passes, and then goes through one or more tubes, and downwards into an annular chamber surrounding the burner. The air passes at the lower end of the chamber into the space between the deflecting disc and the flame within the lamp globe. In this case also, the cross-sectional area of the burner increases towards the outer orifice. The burner is, as before, composed of two parts joined together and secured to the upper part of the annular air chamber. The gas is led to an orifice in the centre of the chamber and corresponding to the upper end of the burner orifice.

Automatic Portable Pressure Register.—Chester, W. R., and Selby, J. of Nottingham. No. 14,268; Sept. 10, 1889. [6d.]

This portable instrument for automatically recording the pressure o gas is shown in the engravings. Fig. 1 is a side view of the recording instrument having one side of the wood cover removed, showing an outer vessel in section containing a float. Fig. 2 is a plan of the instrument with the wood lids of the cover removed. Fig. 3 is a sectional view of a stuffing-box with packing compressed round a rod. Fig. 4 is a view of the stuffing-box with its upper gland unscrewed, showing the packing expanded to clear the rod when the instrument is in use.

Fig. 1.

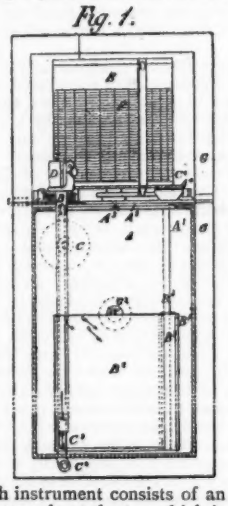


Fig. 2.

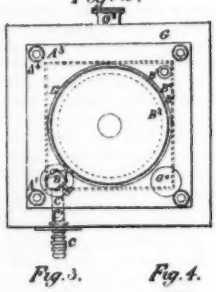


Fig. 3.

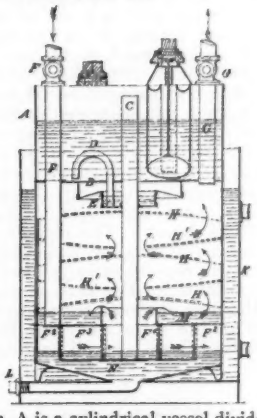
Fig. 4.

Each instrument consists of an outer vessel A for containing water, and open only at the top which is turned inwards to form a flange A^1 on each side. Upon this, a washer of indiarubber A^2 is placed; and above the washer is a covering plate A^3 having a hole near each corner through which screw-threaded studs A^4 pass, and project from the flange of the outer vessel. Each stud is provided with a nut, the screwing down of which compresses the washer A^2 between the covering plate and the flange of the vessel A and forms a water-tight joint. At a short distance from one of the studs, the cover is perforated to allow of the free movement of a tube B within it; and round the perforation, the cover-plate is provided with an exterior screw-threaded projection forming the lower gland of a stuffing-box A^5 containing an elastic indiarubber ring A^6, forming a packing which may be compressed round the rod by screwing down the upper gland A^7 of the stuffing-box (as shown in fig. 3) when it is desirable to make the instrument portable. It may then be carried about without being deranged. When in use, the upper gland A^7 is unscrewed to allow the packing to expand and clear the rod, as shown in fig. 4. Within the outer vessel is a bell or float B^1 open at its lower end, and provided with a cylindrical air vessel B^2 constructed in the usual manner; and within one corner of the bell or float a tube B^3 is secured, extending from the top to the bottom. This tube is free to move up and down on a guide-rod B^4, the lower end of which is secured in the bottom of the vessel A. The two vessels, tube, and guide-rod are shown by dotted lines in fig. 2. The opposite corner of the bell or float B^1 is provided with a tube B, the lower end of which terminates near the bottom of the bell or float, and has slots cut in one side to admit gas to the bell or float.

The gas, as shown by the arrows in fig. 1, is admitted to the recording instrument through the inlet C (shown by dotted lines in fig. 1), from which it passes down a tube C^1 through a short tube C^2 connected to a small vertical tube C^3, the lower end of which is secured in the bottom of the outer vessel and terminates within the tube B near its upper end; the tube C^3 also forming a second guide-rod for the float. The upper end of the rod B carries marking mechanism D like that described in Selby's patent of 1889, No. 6451. The covering plate A^3 carries a cylinder E containing the driving clock, round which is fixed the paper F for a diagram. The recording instrument is enclosed in a wood cover G, through one side of which an outlet-tube G^1 passes, so as to communicate with the vessel A and regulate the height of water in it. The outer end of this tube is closed with a screwed cap G^2. The covering plate A^3 is provided with a screwed stopper G^4, which closes the outlet orifice, through which the water may be poured out of the instrument when necessary.

Carburetting Apparatus.—Howell, H., and Smith, L., of Kennington Lane, S.E. No. 14,686; Sept. 18, 1889. [8d.]

The apparatus forming the subject of this invention is intended for the automatic and continuous carburation of coal gas or air for illuminating or other purposes by impregnating it with the vapour of liquid hydrocarbon proportional to the flow of gas or air, so as to produce at the burners a mixture of gas and hydrocarbon vapour capable of being burnt "from first to last by the same burners without smoke or smell, and without depositing the enriching vapours in the pipes under any normal variations of temperature."



In the illustration, A is a cylindrical vessel divided, by a horizontal partition B, into two compartments—the upper forming a reservoir for the hydrocarbon liquid; the lower constituting the enriching compartment. Within a guide-tube (slotted at the side) there is a float with a stem projecting upwards and bearing against a screw plug, on unscrewing which the float rises, and its stem projecting through the orifice indicates the level of liquid in the compartment. From near the top of the upper compartment, a central tube C extends down to nearly the bottom of the lower compartment, where its mouth is notched across. A syphon D, having its mouth opening near the bottom of the upper compartment, has its longer limb passing through the partition B, and dipping into the liquid in a well E. F is a pipe with a stop cock F^1, for admitting the gas or air that is to be enriched to an annular space F^2 at the bottom of the lower compartment. Below the mouth of the pipe there is a baffle-plate, causing the gas or air to spread laterally. G is a pipe with a stopcock G^1, by which the enriched gas or air issues from the top of the lower compartment. H H^1 are perforated partitions alternately convex and concave covered with flannel or felt, with which fabric the vertical interior surfaces are also lined, as well as those of the circular partitions in the space at the bottom. The fabric covering of the convex partitions H does not extend quite to the circumference; and the covering of the concave partitions H^1 does not extend quite to the centre. The lower compartment is preferably provided with a jacket K, in which during cold weather the warm water can be kept circulating. The lower compartment can be emptied by opening the screw plug L.

The action of the apparatus is as follows: The cocks F^1 G^1 being closed, and the plugs opened, liquid hydrocarbon, such as benzole or other volatile products of coal tar, is poured in. When the liquid rises above the bend of the syphon D, it passes either from the well E or directly from the syphon mouth on to the uppermost convex partition H, along which it flows from the centre outwards; thence along the next concave partition flowing towards the centre; and so on, until it reaches the pan M. When this pan is filled, the liquid overflows its inner lip into the bottom space N, in which it rises till it seals the mouth of the pipe C. When this pipe is sealed so as to prevent the passage of air out of the lower compartment, the syphon D ceases to deliver liquid from the upper compartment, in which the liquid then rises as it is fed in until the float shows that it is sufficiently filled. The plugs being now closed, and the cocks F^1 G^1 opened, gas descends to the bottom by the pipe F; and being spread laterally by the baffle-plate passes along the annular space F^2, and an inner annular space F^3 to the central space F^4, whence it finds its way (as indicated by the arrows) through the successive partitions H H^1, taking up vapour of the hydrocarbon, and issues by the pipe G enriched. When so much of the hydrocarbon at the bottom is evaporated as to unseal the mouth of the pipe C, so that gas can pass to the upper compartment, the syphon D or D^1 operates to discharge liquid into the lower compartment until the pipe C is again sealed.

APPLICATIONS FOR LETTERS PATENT.

12,179.—Ford, H. H., "Improvements in gas, steam, and other gauges." Aug 5.

12,424.—Foxall, J., "Improvements in dry gas-meters." Aug 8.

12,438.—Long, C., and Sproule, R. K., "Improvements in heating attachments for gas-burners and lamps." Aug. 8.

CORRESPONDENCE.

[We are not responsible for the opinions expressed by correspondents.]

The Wire-Rope System of Gasholder Guiding.

SIR,—In reply to the letter of Messrs. Ashmore, Benson, Pease, and Co., Limited, we are afraid that their attempt to remove what they profess to think a misapprehension is only likely to result in further mystification to your readers. We are unable to see any relevancy to the position of affairs between us and them in the described holder construction.

The result of the appeal referred to is to establish our priority of right to the tensional or wire-rope guiding of holders, which it was Mr. Pease's object to prevent us obtaining. As it was *our* application for a patent which was opposed by Mr. Pease, and when the Comptroller decided in our favour, such decision was appealed against by Mr. Pease, with the result already reported, it is rather beside the mark to say that Mr. Pease's patent was not impeached thereby. *One thing at a time* in these matters is somewhat of a necessity. The Solicitor-General has decided that *we* have the prior right; and that is, for the present, sufficient. We shall uphold our rights to the utmost, and intend, at the proper time, to prosecute any infringements of our patents, whoever may take the risk of such action.

GADD AND MASON.

Manchester, Aug. 14, 1890.

Gasholder Construction.

SIR,—I can assure Mr. Gadd that I am not wedded to the defence, or otherwise, of any particular kind of gasholder. Hence, as his words imply, it is very difficult for him to ascribe any interested motive to me for my impartial judgment. When I wrote the letter on the history question, I did not for one minute imagine Mr. Gadd, or anyone else, would contradict it.

To put it briefly, Mr. Gadd represents me as saying (see his letter in the JOURNAL for July 29) that Mr. Webber proposed a gasholder having only 6 feet of guide-framing; and that therefore I considered, *on those grounds alone*, he was the first to *suggest* abolishing guide-framing *entirely*. I positively deny that I have said anything of the sort, or that would lead a careful and impartial reader of my words to so construe them. Mr. Gadd, to use a common expression, *puts the cart before the horse*. What I said, as plainly as I could put it in words, was this—that Mr. Webber *suggested* doing away with guide-framing altogether; and then, *as a step only towards the attainment of his object*, he proposed reducing it to 6 feet in height.

Mr. Gadd evidently does not think I am right in drawing this conclusion from Mr. Webber's original article (contained in the JOURNAL for March 29, 1887), viz., that he proposed or suggested abolishing the "external or upper guide-framing" *entirely*. I can only repeat that I did; and that before Mr. Gadd was ever heard of in connection with gasholder construction. Moreover, I am not alone in doing so. The correspondence published in the JOURNAL on this subject before Mr. Gadd appeared, proves conclusively that leading gas engineers gleaned the same idea as I did from Mr. Webber's article—viz., that it was primarily a suggestion to abolish guide-framing entirely. As Mr. Gadd seems to think I was driven to extremities to "unearth evidence for my history," I will quote extracts from the letters referred to, and which appeared before he was known in connection with the matter.

The week following the publication of Mr. Webber's article (April 5, 1887), Mr. Wyatt, in commenting upon the abolishing of guide-framing entirely, says:

"To compensate for this [the removal of the guide-framing], there mus be sufficient cantilever strength provided in the framework attached to the holder itself, and the necessary *holdfast* or purchase at the root of the structure, to prevent it running away and toppling over *en masse*. How to effect this with free, moveable rollers to the lower curb is the problem. '*Dead weight and tight bottom rollers*' is not enough to perform this duty. There are, however, I think, methods and appliances at hand to create this help; but they must be designed with the utmost simplicity, and be safely automatic in their action. Thoughts I have had upon this point for years."

Mr. Wyatt closes his letter with the following sentence:—

"I quite anticipate the production of a self-sustaining gasholder in the future."

The letter is followed by an editorial note: "We acknowledge, with great satisfaction, the substantial support of the principle enunciated in our article which is expressed in Mr. Wyatt's *last* sentence."

In the JOURNAL for April 19, 1887, Mr. H. E. Jones writes:

"I am impelled to the observation that there can be no doubt, from a mechanical point of view, of the possibility of sufficiently upholding a gasholder of the ordinary proportion between diameter and height, whether of one, two, or three lifts, by mechanical devices other than that of the normal external guide-framing. The drawback of any such device, however, must be the increase of weight in the floating part of the structure, if it in other respects is to have stability and endurance. This increase of floating weight would mischievously increase the pressure thrown by the gasholder, which I am bound to confess I already find, in my own practice, to be getting unduly great in gasholders of more than two lifts."

Mr. George Livesey writes as follows on April 26, 1887:

"If some *practicable* means could be devised whereby all the bottom rollers might be made to rise or fall equally, and none of them could either rise above or fall below the others, the holder would then, to all intents and purposes, have a solid foundation, and no columns or guide-framing of any kind would be necessary. . . . Of course, if the writer of the article is right in his contention, all trouble about rollers and carriages is labour in vain; but I cannot think that he is right. . . . The writer of the article practically says *the rollers on the bottom curb bearing on the tank are sufficient*; and I must say that, while they no doubt would prevent the bottom of the holder from moving laterally, they could not exert a similar influence on the top, which would inevitably go over."

Each one of these gentlemen, therefore, gleaned the same idea as I did from Mr. Webber's paper. Even Mr. Gadd, in his first communication on the subject (see JOURNAL, Aug. 16, 1887), speaks of "Mr. Webber's proposal to *dispense* with external framing," and suggests a scheme of "opposite leverage carried below ground," whereby to effect it."

Mr. George Livesey, in his paper read before the Southern District Association, on Nov. 8, 1888, in reviewing this very question, said:

"But 'Theory and Practice,' at the close of the last article above mentioned, has a 'Note on Mr. Gadd's Gasholder,' which shows that, by a different form of guiding, the method of determining the strains must be different; and this points to the possibility of further reducing or abolishing the framing, and brings us back to the article in the JOURNAL [Mr. Webber's] for March 29, 1887, and to Mr. Webber's paper of last year—*to whom undoubtedly belongs the credit of the really original idea of constructing and working gasholders without external framing*. Until he *suggested* the idea, it had never, so far as I know, been even thought of; and if gasholders should ever be so constructed, *the merit of the suggestion rests with Mr. Webber*. After this it occurred to me that if some means could be devised whereby the bottom curb, while free to rise and fall, could be maintained perfectly level, a great step would be made in the direction *indicated by Mr. Webber*."

Mr. Livesey then quotes the passage from his letter of April 26, 1887, given above. Then again, in referring to the strains on the holder, Mr. Livesey continues:

"If, however, these strains can be proved to be of no great moment, then Mr. Gadd will have shown how *Mr. Webber's idea of no guide-framing* can be made practicable."

Of course, I am quite prepared to hear from Mr. Gadd, in the next number of the JOURNAL, to the effect that Mr. Livesey was only joking, or did not mean what he said, or by some other twisting of his words to make him mean something entirely different from what he really did mean. But I ask, Why did not Mr. Gadd contradict Mr. Livesey's historical account at the time? He was present, and spoke afterwards at the same meeting; but he did not deny Mr. Livesey's words.

I am really beginning to think that there was some justification for Mr. Webber's remark at The Gas Institute meeting this year, that "Mr. Gadd seemed disposed to arrogate almost everything to himself." When I first read these words, I was inclined to think they were too severe; and on that account, as much as anything, I wrote what I did to the JOURNAL, hoping to set the matter at rest, and never dreaming that Mr. Gadd—of all persons—would take exception. The only credit I gave Mr. Webber in my letter was that of the *suggestion*—as Mr. Livesey has done—and also of a proposal as a *step* in the direction of his object. Mr. Webber's *suggestion* has borne fruit in Mr. Gadd's holder; but the step he proposed was, as I endeavoured to show at the time, impracticable. I then gave Mr. Gadd the credit of being the first to show how a gasholder could be constructed without any external guide-framing whatever. But he is not satisfied with this; he wants to be thought the first to have *suggested* that such a thing should be done. This the above extracts from letters written and published before he was heard of in the matter show clearly he cannot claim, without being justly charged with arrogancy.

I conclude by again repeating that, in my judgment, and in the judgment of leading gas engineers of the day, as shown by their letters, &c., Mr. Webber was the first to *suggest* the *abolition of guide-framing altogether*, and the first to propose a plan, which if it had been practicable would have been looked upon as a gasholder, "to all intents and purposes," without guide-framing. Mr. Gadd, however, was the first to make the suggestion bear fruit by the invention of his spiral-guided gasholder. The proposal for reducing the guide-framing by the height of two lifts being retraceable to Mr. Livesey's letter of Dec. 27, 1881.

From this opinion—which I stated to be the true "history" of the question, and which I still adhere to, in common with other engineers, and not, as Mr. Gadd states in his last letter, contrary to them—I see no reason to depart; and I cannot imagine how Mr. Gadd or anyone else can conclude otherwise, without wilfully wresting the obvious meaning of the words already published on the subject, and substituting a meaning altogether foreign to that they were intended to convey by the writers of the same.

F. S. CRIPPS.

Sutton, Aug. 14, 1890.

SIR,—I am loath to join in the discussion in which Mr. Gadd and Mr. Cripps have been engaged, and which chiefly turns upon my own humble contributions to the literature of this interesting subject. I have been curious to see what these two controversialists would make out to have been my part in this new movement in gasholder design; but the amusement inherent in playing the part of shuttlecock between two battledores is not sufficiently keen to excuse one for permitting the game to be kept up too long. Besides, I fear your readers must be weary of these personalities; and I should be very sorry to jeopardize the successful development of what I regard as a most valuable idea through allowing it to be attached to any individual reputation, if a word from me could prevent such an undesirable complication.

Briefly, then, while disclaiming all desire to make capital out of the fact, I must emphatically state that I did for some time previously ponder upon, and in the early part of 1887 begin to formulate the notion that gasholders might be guided *wholly and solely from the base or bottom curb*. Recognizing, of course, that a single tier of rollers in one plane would not suffice for this end, I proposed, as one way of doing it, what may be fairly described as a bottom curb 6 feet deep with two tiers of rollers vertically over each other. Mr. Gadd improved on this by placing the double rollers closer together, and making them grip a spiral guide, which I had not thought about; being I suppose habituated to the simple vertical movement of holders. Mr. Gadd may think I should injure him in saying that the difference between his double rollers and mine is only one of degree; and he is quite welcome from me to make as much as possible out of the difference in kind that arises out of his spiral guides as contrasted with my vertical ones. Certainly, however, the difference in 1887 between my views and those of Mr. Livesey, as expressed at Glasgow, was only one of degree, as any reader of the discussion on my Gas Institute paper must perceive.

This leads me to what I am anxious to point out—that in and before 1887 this question of the fundamental reform of gasholder design was in the air. Mr. V. Wyatt was thinking about it; Mr. Livesey was working at it; and so may have been many more besides myself, for anything I know. Nothing is more difficult, or as a rule more futile and thankless, than to assign to any particular participant his true share of original suggestion in connection with a technical development of this order. I for one shall be content with my own

small part in bringing about the general reconsideration of the principles of gasholder guiding, whatever that share may be, if only good comes of the movement. If I was a little hard upon Mr. Gadd at Ryde, it was not, as my conscience assures me, through any jealousy of the part he has played, or envy of the recompense he hopes to gain. If it had been anybody else who talked about "my cantilever *principle*" and "my other *principle*," I should have protested with equal vehemence; because I think it sufficient if a man can devise a generally admired application or method—principles may well be left general possessions in controversy as they are in law.

W. H. Y. WEBBER.

Aug. 16, 1890.

Mr. Cripps's Criticism.

SIR,—If Mr. Cripps fondly imagines the "agony" he quotes was mine, I will not attempt to deprive him of the solace such a feeling may afford him. I am sorry, too, that I cannot gratify Mr. Cripps by admitting the erroneous character of my paper, which he labours so hard to establish, and pleads so often for me to concede. Is it possible that this course is taken to avoid confessing his own error in regard to the false drawing of the bent cantilevers, when connected with a sort of semi-rigid top member? Any way it is something to find, after all the writing he has so kindly bestowed upon the data of my paper, that it is the *method* thereof which really forms the trouble of his mind. I shall therefore pass over all the apparently, utterly unnecessary verbiage, and repeated quotations, forming the early portion of his letter in your last issue, and come at once to his criticism of the word "*if*." I employed this word openly, and quite innocently, and in perfect good faith. Yet, Mr. Cripps does not hesitate to stoop to the charge that in doing this I was "knowingly misleading" my hearers. I can only say to Mr. Cripps that such a charge is monstrous; and if made by one for whom I had conceived less respect, I should decline to bandy words for a single minute. Mr. Cripps really infers that the working out of the exact strain on each rail is, after all, not so simple, if all the conditions are taken into account, when, he says, "*approximation* to the truth could be obtained without any complex details." Exactly; and *if* we roughly assume an equal distribution of the force vertical on each rail, we shall probably be as *approximately* correct as by taking a certain amount of further trouble.

On Mr. Cripps's authority simply, we are told that I have understated the strain on my holder "to a fivefold extent." This, I presume, means that the wind force should be 60,000 lbs. or 30,000 lbs. (as the case may be), multiplied by 5—*i.e.*, 300,000 lbs. and 150,000 lbs. respectively. I cannot think he believes what he has said on this point; it must be a slip of some sort. It is a gross misrepresentation to say that I ever suggested the whole force can be thrown on to one rail; and the words our friend quotes cannot be twisted, by the most perverted ingenuity, to mean anything of the kind. How he arrives at his wonderful result of 16 times the downward pressure is remarkable. On this theory, which is really assuming infinite rigidity for the holder, a structure a mile or a hundred miles in diameter would be as well served with three rails to carry it level as by any greater number. Clearly we need some definitions, as without them we are necessarily beating the air.

Anxiety to prove infallibility is dreadfully manifest in the recurrence to the *plus* and *minus* signs. Mr. Cripps allows himself to try, in a most inexcusable manner, to make out an admission on my part, where an absolute *denial* was actually made. Anything like scientific discussion becomes utterly impossible under such a systematic distortion of words. As this is an "insignificant point," I can see no object in the repeated recurrence thereto, except the desire to pose as something superior. The use I made of the signs is one I have been accustomed to, and found convenient, for a quarter of a century; and as I have seen greater men than even Mr. Cripps use them in a similar manner, both for electrical and mechanical forces, and although I may have been trained in a different school to my friend, I shall require something more than a mere form of expression to cause me to admit error where it is not, or to plead guilty to a merely superficial knowledge of mechanics, which our friend so very politely hints. Any way, I have been engaged upon these same mechanics during the greater part of a lifetime, whether in a superficial or other manner, and perhaps not without some good few results valuable to the world at large.

I now understand Mr. Cripps to simply object to my method of exposition of how the wind force operates on my holder, and distributes the resistance amongst the various parts thereof and on the rails of the tank. "When a doubt arises as to the operation of a force, try an experiment." I keep that maxim always before me; and I checked off my conception of the forces operating by a number of experiments. I find it impossible to put the total resistance on to one rail. I find that *all* the rollers are strained as a matter of fact; and there are no two in a neutral condition, even when the plane of force is as exactly as can be effected at right angles with the axis passing through two rollers. "So much the worse for the facts," I suppose; at least it is very wrong of them. May I suggest that Mr. Cripps might find it advantageous to bestow a little trouble on experiment before finally committing himself to any theory or method.

In conclusion, I do not find Mr. Cripps brings any objection to my holder as such; but only to my paper. Well, if ever he has the fortune to design one, I shall not object to him making himself safe in his mind, by adding strength to any portions which *his* method constrains him to demand. It will probably not hurt anyone.

W. GADD.

Manchester, Aug. 14, 1890.

Responsibility for Gas Supply beyond the Meter.

SIR,—Your remarks under the above heading, in the JOURNAL for the 5th inst., do not put the case of the Aldershot Gas and Water Company quite in the way in which they look upon it; and there are at least two points of difference between our position and that of the South Metropolitan and Gaslight and Coke Companies in the lawsuit referred to. There are besides general principles involved in the decision given between these Companies, which I think warrant me in asking you to insert a letter on the subject. The differences relate to the facts that at present no gas passes from our district into that of the Farnborough Gas Company, and therefore there is no actual question at issue between us; and, further, that if gas did so pass, or if in the future it should so pass, it would be after interception by the gasholders of the War Department, which, in the matter of supply, are beyond our control.

It is not necessary to reproduce the evidence which you have published, and in which the action of the gasholder is shown to be a most important factor; and I need only cursorily refer to the principle which was laid down in the decision, and which is generally known—that the pressure exerted by the gasholders of the South Metropolitan Company influenced the supply up to the burner, and extended the responsibility of the Company to that point, although the sale and delivery to the Railway Company took place at the meter. The decision of the House of Lords is at present the accepted law as regards cases on all-fours with that of these two Companies. The old theory is undoubtedly overturned—that the meter is in all cases the terminal point of delivery by a gas company; and the influence of pressure by the company's holders must be accepted as extending the supply to the point of combustion.

At Aldershot, we measure the gas supplied to the War Department by a large meter on our works; but we deliver the gas so measured into gasholders belonging to the Government situated fully a mile distant from us, but nearly half a mile within our own district. We have the control of these holders only for the purpose of filling, but do not interfere in any way with the valve controlling the supply from them; and we contend that there our delivery and our responsibility terminate. Mr. H. E. Jones, in his evidence, endeavoured to show that such is not the case, but that the holders, being filled by a pressure heavier than their own, only transmit the superior pressure thus originally exerted, and that, in fact, such pressure continues to be the pressure furnished from our works. Now, as this is a theory which may enter into either attack or defence in some possible future law contest, I desire at this point to energetically protest against it. I wished to have been again put into the witness-box before the Committee, in order to contradict it. But Counsel considered that we had practically gained all we wanted at the time; and so I was not re-examined.

At the root of the matter is the interpretation to be put on the word "pressure." No doubt, in certain circumstances, Mr. Jones would be correct. He would be right, for instance, in the case of a gasholder working with stops, and having the inlet and outlet valves both open. He would also be correct in the case of the introduction of a pressed fluid into a fixed or inelastic vessel, in which the outgoing force would be merely the elastic recovery of the fluid from the compressing force originally applied. But I contend that he is wrong in the present instance, because when the gasholders referred to have been filled (which is invariably done in the daytime, during the hours of non-consumption), the inlet-valve is closed, and the pressure thereafter is given by the weight of the War Department gasholder. In other words, it is no longer the force sent from our works, but the weight of that holder exerted over its own superficial area upon the gas it contains. For instance, our largest telescopic holder gives a pressure of 6 inches; and by it the holders of the War Department are generally filled. If the inlet and outlet valves of the War Department holder are left open, undoubtedly the 6 inches of pressure would go on to the burner (the holders work with stops); but inasmuch as the inlet-valve is shut when the holder is full, the pressure is no longer 6 inches, but only 2¼ inches. By applying back-balance weights to the holders which are thus filled, this pressure could be reduced to nothing at all; and by removing these weights from the back-balance and placing them in the holders, a pressure of more than 2¼ inches could easily be obtained. The gasholder could thus be filled at zero, and thereafter altered to give any pressure required. I say that the 2¼ inches of pressure remaining in the holder under its normal action has little or nothing to do with the original pressure introduced, as if it were not for the weight of the holder this pressure would immediately vanish; and it is this weight continuously applied which maintains it. But I say further that if by the manipulation of back weights the gas entered at no pressure at all, and the pressure were subsequently applied by changing these weights, then no pretence whatever could be made that the original pressure of our gasholders had been transmitted, or that the supply extended beyond our delivery within our own district upon the works of the War Department.

A word before concluding, on the general principles involved. The old theory was that the public roadways comprised the district, and that one of the principal advantages of an Act of Parliament in gas supply was to enable an incorporated company or an authorized individual to open these roadways in order to lay down, repair, or lift the gas-pipes. The new theory is that the area within certain boundaries is the district, and that the supply within this boundary-line is sacred. Now, I am not questioning the validity of the law as it has been decided; but I ask, Is such a law in all cases workable? Take, for instance, the Government position at Aldershot. Why should the War Department not manufacture its own gas within our boundaries, and sell such gas to another Government Department within the limits of the Farnborough Gas Company? Or why should a private firm owning land and houses on both sides of the line, and having their business arrangements such as to necessitate the division of their accounts into departments, not do the same thing? There is nothing that I know of to prevent this, except the creation of a public nuisance by the opening of roadways; and if roadways do not require to be opened, who can interfere? The old theory certainly appears in these cases to be the most workable, and the most easily understood. Then take our case, of a possible supply by Government from the War Department holders, into the Farnborough Company's territory. If this is done, that Company may apply for an injunction; but against whom? Probably against us, for supplying gas to be so transmitted. But how are we to prevent it? We are an incorporated Company, bound to supply everyone within our limits; and we could not stop the supply to the War Department without violating this obligation. It is certain the War Department would not oblige us by altering their arrangements, unless they were forced to do so; and, under the circumstances, my contention that the holder of the War Department is

in the present case the point of delivery, and so far as we are concerned the ultimate point of supply, cannot, I think, be controverted without serious difficulty.

A. F. WILSON.

Aldershot, Aug. 11, 1890.

Liability of Sulphate of Ammonia Stills for Excise Duty.

SIR,—We have connected with our gas-works sulphate of ammonia plant, which has been worked for a great many years, under the powers of an Act of Parliament, and also of a certificate from the Board of Trade, for which we pay £3 annually. We are now called on by the Inland Revenue Commissioners to take out a licence under section 9 of the Customs and Inland Revenue Act, 1890 (53 Vict., cap. 8), in respect of the stills used for the manufacture of the sulphate. I should be glad to know if any of your readers have had a similar experience lately.

MANAGER.

Aug. 14, 1890.

[The following is the section of the Act referred to by our correspondent: "Every excise licence to carry on any trade or business (except the trade or business of an appraiser, auctioneer, or hawker) which shall hereafter be granted, shall only authorize the person to whom the licence is granted to carry on the trade or business mentioned therein in one set of premises to be specified in the licence."—ED. J. G. L.]

Duffield Water Supply.—The Belper Rural Sanitary Authority have instructed Mr. W. H. Radford, C.E., of Nottingham, to report on the best mode of obtaining a water supply for the villages of Duffield and Duffield Bank, in Derbyshire.

Proposed Extension of the Bradford Corporation Electricity Works.—From the minutes of the Gas and Electricity Committee submitted at last Tuesday's meeting of the Bradford Corporation, it appeared that, at a special meeting of the Committee held on the 8th inst., tenders were considered for the supply of engines, &c., required for the extension of the electricity works. The matter was referred to the Electricity Sub-Committee, who subsequently met on the same day. The latter considered a tender, which had been referred to them by the General Committee, of Messrs. Siemens Bros. for the supply of engines, &c.; but the prices in it were regarded as too high, and the Town Clerk was instructed to write with a view of having them reduced. The minutes were adopted.

The Electric Light at Leamington.—At the meeting of the Leamington Town Council on Monday of last week, there was again a long discussion respecting the electric light. Mr. Crowther Davies expressed surprise that the Watch Committee had not complied with the decision come to at the last Council meeting, that they should report month by month whether or not the electric light was in accordance with the terms of the contract. All they had done was to say it was not efficient; and even this was given more as a private complaint than as a report. The Electric Light and Power Company, he believed, were labouring under the delusion that they were supplying the town with the requisite voltage of electricity, and that the public lamps gave 16-candle light. This was an error which called for mild treatment on the part of the Corporation; and with the view of removing the impression, he proposed that the Company should be invited to co-operate with the Borough Surveyor in carrying out a succession of tests of the illuminating power of different incandescent street lamps, in order to ascertain whether or not the illuminating power was in accordance with the terms of the contract between the Company and the Corporation. Mr. Bright said there was every reason to believe that the current supplied was frequently less than that agreed upon, in addition to which the lamps were much depreciated. The motion was adopted.

The Water Supply of the Barnsley Out-Districts.—At the meeting of the Barnsley Town Council last Tuesday, the subject of the water supply to the townships situated just outside the borough was under consideration. The matter had been twice adjourned, and arose from a minute to the effect that, "in view of the present and prospective requirements of the borough, the Water Committee recommend that notice be given to the Local Boards for the districts of Darton, Monk Bretton, and Worsborough, and the Sanitary Authority for the townships of Ardsley and Cudworth, that after Jan. 1, 1892, the Authority will probably not be able to supply water to these districts and townships; but in the event of the Council being able to secure additional facilities for water supply, they will be prepared to treat further with them." Alderman Brady, the Chairman of the Committee, moved the adoption of the minutes, stating that during the quarter ending June 30 the supply to some of the out-townships had been so large that the question had seriously forced itself upon them; and the increased drain on the water-works had been such that the time was fast approaching when the present supply to the out-townships could not be secured. They were not legally bound to serve the five townships named; but others named in the Act could claim a supply. The Committee were convinced that they would not be able to supply the out-townships as at present in about 18 months, unless something were done. The notice did not take effect until 1892; and in the meantime they might be able to increase the supply by temporary means. For the past three years there had been a gradual increase. But in the last three months, it had gone up by leaps and bounds; and they were driven to one of two conclusions—viz, either to secure a larger supply, or curtail the sale of water where they were not compelled to furnish it. The matter was before them eight or ten years ago, when plans and specifications were prepared by Mr. T. Hawksley. These plans were still in existence, and were made with a view of securing a further supply from the district adjoining the present works. Alderman Blackburn moved an amendment to the effect that the matter should be referred back to the Committee, to consider whether or not it was necessary to apply to Parliament for power to increase the present supply, and also whether it was desirable to give the Council authority to sell to additional people in the district. After considerable discussion, Alderman Brady replied; stating that, at an early day, the Council would have an opportunity of discussing some definite scheme. The motion was carried.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

During the past week the following progress was made:—

Bills read the third time and passed: Airdrie and Coatbridge Water Bill; Tottenham Local Board Bill.

Bills Royal Assented: Bradford Corporation Water Bill; Electric Lighting Provisional Orders Bills (Nos. 10, 11, 12, and 14); Gas Orders Confirmation Bill; Plymouth Corporation Bill; South Lincolnshire Fen Water Bill; Sutton, Southcoates, and Drypool Gas (Electric Lighting) Bill; Tunbridge Wells Improvement Bill; Warrington Extension, Water, &c., Bill.

HOUSE OF COMMONS.

Tuesday, Aug. 12.

AMENDMENT OF STANDING ORDERS.

The following (among other) amendments of the Standing Orders were agreed to: Order 5 was altered so as to make the notices to be given for Bills to authorize the construction of gas-works, sewage-works, or works for the manufacture or conversion of residual products, specify the limits within which such works are intended to be erected. Order 15 now specifies that notice is to be served upon the owner, lessee, and occupier of every dwelling-house situated within 300 yards of the limits within which such works are to be constructed. Order 188 now states that every Bill for the above-named purposes is to contain a clause defining the limits of the gas, sewage, or residual products works. A new Standing Order (No. 184) has been added in respect of compensation water, as follows: "That in the case of every Bill whereby it is proposed to impound the whole or any part of the water of any river or stream, and to give a flow of water in compensation for the water so impounded, the Committee on the Bill shall inquire into the expediency of making provision, so far as may be practicable, that the whole or a minimum amount of such compensation water shall be given in a continuous flow throughout the 24 hours of every day, and shall report to the House accordingly."

[Similar alterations were made in the Standing Orders of the Upper House.]

Friday, Aug. 16.

The Electric Lighting Provisional Orders Confirmation Bill (No. 15), containing the Orders relating to the lighting of the City of London, was reported without amendment, read the third time, and passed.

POLLUTION OF THE THAMES BY HOUSE-BOATS.

Mr. BAUMANN asked the President of the Board of Trade whether his attention had been drawn to the evidence of Sir R. Rawlinson, given before the Committee of the Corporation of London who are inquiring into the water question, to the effect that the drainage of house-boats into the Thames was prejudicial to the water supply of the Metropolis, and whether, in the interest of public health, he would direct the official representative of the Board of Trade on the Thames Conservancy Board to urge upon the Conservators the necessity of taking some steps to prevent this nuisance.

Sir M. HICKS-BEACH said his attention had not been called to the evidence referred to; but he would direct a communication to be made to the Thames Conservancy Board on the subject. He observed, however, that, in the last report of the Conservators, they stated that "their officers continue to watch house-boats and steam launches, with a view to the detection of any pollution from these vessels."

Lead-Poisoning at Drighlington.—At the meeting of the Drighlington Local Board last Thursday, the Medical Officer (Dr. Forsyth) reported that, from the large number of cases of lead-poisoning that had been under his care recently, he was satisfied that the water supplied by the Bradford Corporation was not in a satisfactory condition; and he recommended that strong representations should be made to them to see if such a state of affairs could not be remedied. Considerable discussion arose; and in the end the Clerk was directed to draw the attention of the Bradford Corporation to the Medical Officer's report.

Lectures on Cookery and Exhibition of Gas Appliances at Westbury.—A series of demonstrations on cooking by gas, together with a small exhibition of gas stoves and appliances, was held in the National School-Rooms, Westbury, last Tuesday and the two following days. It was promoted by the Westbury Gas Company in conjunction with Messrs. John Wright and Co., of Birmingham; and the lectures were delivered by Mrs. Thwaites, of the Liverpool School of Cookery. At the opening of the first lecture, Mr. Norton H. Humphrys, of Salisbury (a Director of the Company), announced the object of the undertaking, saying that it was an advertisement of the uses of coal gas, intended to show plainly, clearly, and thoroughly the most efficient and economical methods of employing it. Since, he said, the Company were not Cheap Jacks, here to-day and gone to-morrow, but were permanently located in the town, they were not interested in securing a large but transient sale of gas, as would be the case if they recommended anything that was wasteful or extravagant, but desired to develop a permanent, steady trade, which could best be done by showing their customers how to economize in every possible way, and get the best value obtainable from the gas they used. For this reason they had arranged to carry on the supply and fixing of gas-fittings of every kind, on liberal terms, and to let gas-stoves on hire. They would be pleased to attend to any complaints, or to advise in any difficulty that might arise in connection with these matters. The whole arrangements were carried out under the superintendence of Mr. Humphrys, and the attendance was good, more especially in the evenings, when the room was crowded. After the last lecture, Mr. Humphrys, in proposing a vote of thanks to Mrs. Thwaites, repeated the announcement above given. Mr. H. W. Pinniger, Secretary to the Company, seconded the proposition, which was supported by Mr. J. Hillman, a Director of the Company, and heartily carried.

MISCELLANEOUS NEWS.

SOUTH METROPOLITAN GAS COMPANY.

In the JOURNAL last week we published the report of the Directors of this Company for the half year ending June 30 last, which will be presented at the meeting of shareholders to be held to-morrow. We now give the accounts for this period; epitomizing, as on previous occasions, those portions in which there is little or no change, and giving the remainder in full.

Statements Nos. 1 and 2 show the amount of share and loan capital raised at the end of June last. The former stood at £1,991,500, the latter at £650,000—both as before.

Statements Nos. 3, 4, and 5—the capital, revenue, and profit and loss accounts—are given in full on the opposite page.

Statements Nos. 6, 7, and 8 show the positions of the reserve, renewal, and insurance funds. The reserve fund has been reduced from £220,544 1s. 2d., at which it stood on Dec. 31 last, to £198,837 9s. 6d., by the transfer of £21,706 11s. 8d. to the profit and loss account. The renewal fund stands at £8190; and the insurance fund at £12,579—a decrease in the latter case of £15,000, transferred to the profit and loss account to meet the expenses of the strike.

Statements Nos. 9 to 11—furnishing particulars as to the manufacturing operations of the Company—are given in full; as is also No. 12, the general balance-sheet.

THE EXAMINATIONS IN GAS MANUFACTURE.

The Questions Set at the Last Examinations.

In the JOURNAL a fortnight ago we gave a list of the successful candidates at the examinations in Gas Manufacture held by the City and Guilds of London Institute this year. We are now able, as on former occasions, to publish the questions put to the candidates, which will give those who intend submitting themselves for examination on the next occasion an idea of the nature of the papers set in each grade.

Ordinary Grade.

1. Give a description and sketch of the hydraulic main and dip-pipe. What purpose does this arrangement serve? 2. Of what material should a gas-retort be made, and why? 3. Of what, stated in general terms, do the gaseous products that pass into the "foul" main consist? 4. Describe the effect produced by the use of an exhauster. Why is such effect necessary? 5. What change, if any, does coal gas undergo when passing through the condensers? 6. Give a description of a differential pressure-gauge, and state the use to which such instrument is applied. 7. Name the order in which the gas should be caused to pass through the various apparatus on its way from the hydraulic main to the gasholder. 8. What is a syphon, and state the conditions which necessitate its use. 9. By what agency is ammonia usually removed from coal gas? Give reasons for its preference. 10. What is a telescopic, as distinguished from a single-lift, gasholder? Describe any distinctive features.

Honours Grade.

1. Describe the influence of heat upon the economical distillation of coal. 2. State as briefly as you can the reasons for and against the use of trussing for the crowns of gasholders. 3. Give a description of the form of mechanical exhauster with which you are most familiar. 4. Under what conditions may the dip-pipe be dispensed with? 5. What do you consider to be an economical consumption of fuel for heating gas-retorts, stated in pounds of coke per ton of coal carbonized; and how would you design your furnaces, and regulate their working, in order to obtain such a result? 6. Is it desirable at any time of the year to reduce the temperature of coal gas below that of the atmosphere? Give reasons for your answer. 7. What are the comparative advantages of wet and dry meters? Describe the construction of the latter. 8. Give a description of the distillation or Wills test for determining the strength of ammoniacal liquor. 9. State the order in which the chief impurities are removed when lime only is employed for purification, and give reasons. 10. Give a sketch, in section, of a station gas-governor, and describe the use of this apparatus.

THE BOARD OF TRADE AND ELECTRIC LIGHTING.

The report by the Board of Trade respecting the applications made to them under the Electric Lighting Acts, and their proceedings thereon, during the year ending June 30, has lately been issued.

There were 161 applications, of which 45 were made by local authorities and 116 by companies or individuals; 23 referred wholly or in part to the county of London. A large number of the applications related to districts outside the Metropolitan area; and it was found that considerable alterations would be necessary before the Model Order decided upon last year for the Metropolis could be made applicable. The Board of Trade therefore settled a model form for Provisional Orders, based upon those confirmed by Parliament last session which would be applicable to (1) Orders granted to local authorities, and (2) Orders granted to companies outside the Metropolis, and which in the case of the Metropolis followed as closely as possible the forms adopted last year.

The Orders granted to companies have in every case been granted with the consent of the local authority for the district; but in one instance the Board of Trade considered it necessary to hold a local inquiry. In several cases applications were received from the local authority and also from one or more companies for the same area. In such cases the Board of Trade have, in accordance with their rules, given the preference to the application of the local authority.

In the Orders and Licences granted to local authorities, the Board of Trade have, after careful consideration of the representations made to them in favour of such a course by the local authorities, acting as representatives of the ratepayers, inserted a clause authorizing the local authority to transfer their powers, duties, and liabilities to any company or person with the consent of the Board.

The regulations prepared by the Board for the purposes of section 4 of the Electric Lighting Act, 1888, referred to in the previous report, have been settled; and in any case in which their attention has been called to the existence of overhead electric lines to which that section would apply, a notice has been served upon the owners or users of such lines, requiring them to comply with the regulations. (These regulations are given in an appendix to the report.)

A question having arisen as to the interpretation to be placed upon the portion of the schedule of the Electric Lighting Act, 1882, defining local authorities in Scotland, the Board of Trade consulted the Scotch Office, who were of opinion that in certain cases in which authorities in Scotland were authorized to supply gas, they were not the local authority for electric lighting purposes in the capacity in which they supplied gas, and would not be able to utilize the gas-rates for electric lighting purposes in the event of their obtaining powers to supply electrical energy. A Bill to amend the schedule in this respect was therefore introduced.

SUGGESTED PURCHASE OF THE LISKEARD GAS-WORKS BY THE CORPORATION.

At last Tuesday's meeting of the Liskeard Town Council, Mr. Rogers, pursuant to notice, proposed a resolution declaring that the time had arrived when the Council should take the gas supply of the town into their own hands. For many years, he said, the gas supply of Liskeard had been a source of constant irritation inside the Council, and of dissatisfaction among the private consumers. This state of things was not peculiar to Liskeard, but existed wherever there was a gas company. The question of public lighting had frequently occupied the attention of the Council; and the present occasion, when the Gas Company were raising their charges from £3 to £3 5s. per lamp per annum, was, he thought, a favourable one for dealing with the matter in a practical form. At their last meeting certain figures, furnished by the Gas Company, were given, showing the cost to the Company of the public lighting; but he could not believe the assertion that the Company paid £1 a week for the lighting and extinguishing of the lamps. As the Company were merely a private concern, without any powers under an Act of Parliament, there was nothing to prevent the Council themselves undertaking the manufacture of gas. The capital required would amount to between £3000 and £4000, which could be borrowed, after a Local Government Board inquiry, from the Public Works Loan Commissioners. Since notice of the motion was given, the Mayor had received an estimate from Mr. Veale, of St. Austell, for laying down a system of electric lighting in the town, under certain conditions, for about £4000. Personally, he did not think they could obtain a sufficient number of consumers for the electric light to get an adequate return for so large an outlay; but if his proposition was agreed to, he would suggest the appointment of a Committee to consider and report on the probable cost of lighting the town by either electricity or gas. The Mayor (Mr. T. Lang) said that being a shareholder in the Gas Company, he should abstain from taking part in the discussion, beyond saying that as their object was the benefit of the town, he should not interfere with any experiment the Council might desire to make. Mr. Rapson said he saw no reason to disbelieve the statement recently made by the Gas Company, and which he regarded as fair and honest. According to the figures then submitted, the Council was charged only 3s. 4d. per 1000 cubic feet for gas for street lighting; while private consumers paid 5s. At the same time he had always advocated the ownership by corporations of gas and water properties, and should be glad if they could secure them in Liskeard. Mr. Glubb remarked that he believed all the members were agreed as to the desirability of the Council owning the gas-works, but it was a question of money to buy out the old Company. Mr. Feddy seconded the motion, which was carried. On a further proposition by Mr. Rogers, seconded by Mr. Henwood, the Highways and Lighting Committee was instructed to report on the relative cost of electric and gas lighting, and were authorized to incur an expense of £20 in obtaining the opinion of experts.

The Water Supply of Pudsey, Farsley, and Calverley.—A deputation recently waited upon the Bradford Corporation with reference to the future water supply of Pudsey, Farsley, and Calverley; and at a meeting of the Pudsey Local Board on Monday of last week, one of the delegates reported the result of the interview. He stated that the deputation were promised unconditionally that, when the present lease of the local Water Company expired, the water should be supplied to the Local Boards. There was not the slightest desire on the part of the Joint Committee that the Company should be treated unfairly; but they were anxious to have a free hand. Whether or not they agreed with the Company, they had undertaken on behalf of their respective Boards to take the water supply into their own hands at the expiration of the lease.

The Gas-Fittings in San Franciscan Hotels.—According to an extract from a San Francisco newspaper which was reproduced in a recent number of the *American Gaslight Journal*, an ordinance has lately been passed, providing that, in consequence of the cases of asphyxiation by gas which are continually occurring in the large cities of the States, every hotel or lodging-house keeper, having twelve rooms or more for public use, is to have the pipes and gas-fittings in his place tested by a competent gas-fitter, and file a report of such inspection, with the Gas Inspector, every 90 days. The penalty for non-compliance with the order is a fine, or 50 days' imprisonment, or both. This came into effect on the 1st ult.; and, as a beginning, it was also decreed by the Municipality that the first of the reports should be filed by the 10th; but, not a report from the 500 or more lodging-house and hotel keepers affected had then been sent in. There is consequently a prospect of someone being sent to prison.

ACCOUNTS OF THE SOUTH METROPOLITAN GAS COMPANY FOR THE HALF YEAR ENDED JUNE 30, 1890.

No. 3.—CAPITAL ACCOUNT.

Dr.

	£ s. d.	£ s. d.
To Expenditure to Dec. 31, 1889	..	2,735,388 6 4
Expenditure during half year to June 30, 1890, viz.—		
New buildings and machinery in extension of works	16,816 0 8	
New and additional mains and services	3,554 5 0	
Do. meters	1,033 1 9	
Do. stoves	12,079 11 5	
		33,482 18 10
Total expenditure	..	2,768,871 5 2
Balance	..	81,124 14 10
		2,849,996 0 0

Cr.

Description of Capital.	Total to Dec. 31, 1889.	Certified to June 30, 1890.
	£ s. d.	£ s. d.
By A stock	500,000 0 0	500,000 0 0
B stock	1,350,000 0 0	1,350,000 0 0
C stock	141,500 0 0	141,500 0 0
Debenture stock, 5 per cent.	650,000 0 0	650,000 0 0
	2,641,500 0 0	2,641,500 0 0
Premium capital	208,496 0 0	208,496 0 0
	2,849,996 0 0	2,849,996 0 0

No. 4.—REVENUE ACCOUNT.

To Manufacture of gas—			
Coals, including dues, carriage, unloading, and trimming. (See Account No. 9)	£183,672 16 2		
Purification, including £5257 14s. 2d. for labour	7,957 19 9		
Salaries of Engineer, Superintendent, and Officers at works	5,471 9 2		
Wages (carbonizing)	60,295 6 9		
Repairs and maintenance of works and plant; Materials and labour, less £2277 12s. 6d. received for old materials	42,154 10 4		
		£299,552 2 2	
Distribution of gas—			
Repair, maintenance, and renewal of mains and service-pipes, including labour	£12,741 19 9		
Salaries and wages of Officers (including Rental Clerks)	6,555 18 0		
Repairing and renewals of meters and stoves	7,750 16 0		
		27,048 8 9	
Public lamps—lighting and repairing		6,062 7 10	
Rents, rates, and taxes		21,896 5 9	
Management—			
Directors' allowance	£1,750 0 0		
Salaries of Secretary, Accountant, and Clerks	2,839 7 1		
Collectors	5,343 11 2		
Stationery and printing	1,009 8 1		
General charges	3,850 15 9		
Company's Auditors	112 10 0		
		13,805 12 1	
Law charges		1,765 5 9	
Bad debts		1,289 12 6	
Pension and workmen's superannuation and sick fund		2,319 10 11	
Gas Referees and Official Auditor		272 13 8	
Strike expenses		31,978 19 2	
Total expenditure		£405,920 17 7	
Balance carried to net revenue account (No. 5)		59,280 6 10	
		£465,201 4 5	

By Sale of gas—			
Common gas (per meter)—			
At 2s. 3d. per 1000 cubic feet, Lady Day	£174,995 8 4		
Midsummer do.	113,425 13 1		
	288,421 1 5		
Public lighting and under contracts (see Statement No. 11)	28,426 19 6		
		£316,848 0 11	
Rental of meters and stoves		9,757 19 7	
Residual products—			
Coke, less £12,115 9s. 4d. for labour, &c.	£92,514 5 6		
Breeze, less £1742 1s. 1d. for labour, &c.	2,377 4 0		
Tar, less £337 13s. 10d. for labour, &c.	21,984 3 3		
Ammoniacal liquor, less £561 19s. 0d. for labour, &c.	20,171 4 2		
		136,946 16 11	
Rents receivable		1,600 12 0	
Transfer fees		47 15 0	
Total receipts		£465,201 4 5	

No. 5.—PROFIT AND LOSS (NET REVENUE) ACCOUNT.

Interest on temporary loan and deposits	£2,246 19 10	
,, debenture stock	15,843 15 0	
Amount voted by shareholders to officers and foremen	2647 0 0	
Balance applicable to dividend on the ordinary stock	70,461 14 10	
	£91,199 9 8	

Balance from last account	£97,583 8 4	
Reserve fund	21,706 11 8	
	£119,340 0 0	
Less dividend for the half year ended Dec. 31, 1889	119,340 0 0	
Profit on sale of reserve investments	£13,686 0 0	
Insurance fund	15,000 0 0	
Half-year's interest on reserve fund	3,064 5 4	
Amount from revenue account (No. 4)	59,280 6 10	
Interest on Bankers' balances	168 17 6	
	£91,199 9 8	

No. 9.—STATEMENT OF COALS.

Description of Coal.	In Store, Dec. 31, 1889.	Received during the Half Year.	Carbonized during the Half Year.	Used during the Half Year.	In Store, June 30, 1890.
	Tons.	Tons.	Tons.	Tons.	Tons.
Newcastle coal	43,304	288,073	299,124	212	32,041
Cannel coal	1,182	3,390	2,546	—	2,026
	44,486	291,463	301,670	212	34,067

No. 10.—STATEMENT OF RESIDUAL PRODUCTS.

—	In Store, Dec. 31, 1889.	Made during Half Year.	Used in the Half Year.	Sold in the Half Year.	In Store, June 30, 1890.
Coke—cwt.*	182,623	3,781,614	773,130	3,036,024	106,083
Breeze—yards	4,398	59,931	1,831	57,762	4,736
Tar—gallons	437,501	2,906,291	78,125	2,916,598	379,019
Ammoniacal liquor—butts	5,770	92,752	—	95,506	5,016

* 1 cwt. of coke about equals 1 sack of 4 bushels, under Weights and Measures Act, 1878.

No. 11.—STATEMENT OF GAS MADE, SOLD, Etc.

Description of Gas.	Quantity made.	Quantity Sold.			Quantity used on Works, &c.	Total Quantity accounted for.	Quantity not accounted for.	Number of Public Lamps.
		Public Lights (estimated).	Private Lights (per Meter).	Total Quantity Sold.				
	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	
Common	2,935,102	202,673	2,584,791	2,787,464	33,157	2,820,621	114,481	18,191

No. 12.—BALANCE-SHEET.

To Capital—		
Balance—per account No. 3		£81,124 14 10
Reserve fund—per account No. 6		198,837 9 6
Renewal fund—per account No. 7		8,190 15 7
Insurance fund—per account No. 8		12,579 5 5
Net revenue account—for balance, per account No. 5		70,461 14 10
Debenture interest for amount due to June 30, 1890		15,843 15 0
Sundry tradesmen, for amount due for coals, stores, and sundries		44,616 17 10
Deposits by consumers		27,017 18 10
Dividend account (outstanding)		1,264 14 9
Debenture account ,,		14 6
Temporary Loan		10,000 0 0
	£469,926 1 1	

By Cash at Bankers			
Amount invested—			
Reserve fund	£168,109 14 4		
Renewal fund	7,606 1 1		
Insurance fund	17,077 4 11		
		187,793 0 4	
Cash in hand for sundry payments		500 0 0	
Stores in hand—			
Coals	£23,049 0 6		
Coke and breeze	3,543 19 10		
Tar and ammoniacal liquor	3,589 8 2		
Sundry stores	64,288 2 4		
		94,470 10 1	
Accounts due to the Company—			
Gas meter and stove rental, quarter ending June 30, 1890	£132,738 10 11		
Arrears outstanding	1,821 8 5		
		134,549 19 4	
Coke and other residual products		31,997 6 8	
Sundries		8,489 6 7	
		£469,926 1 1	

EUROPEAN GAS COMPANY, LIMITED.

The Bonus Dividend—The Testimonial to Mr. Backler.

An Extraordinary General Meeting of this Company was held on Monday of last week—Mr. H. M'LAUCHLAN BACKLER in the chair.

The SECRETARY (Mr. W. Williams) having read the notice calling the meeting,

The CHAIRMAN said he should not occupy much of the time of the shareholders, as he had repeatedly addressed them on the principal matter which brought them together. No doubt, they would have noticed in the circular convening the meeting the omission of a name which appeared in that calling the previous one. He referred to the unfortunate loss of their colleague Mr. H. J. Baddeley, who was a most efficient Director of the Company, and who passed away after a long and severe illness. He was a man of unimpeachable integrity, and was assiduous in the performance of his duties as a member of the Board, at the meetings of which he would be greatly missed. The Directors had not taken any steps to replace Mr. Baddeley at present. Really they were not bound to do so at all; the present number of the Directors being exactly the minimum. The subject, however, would be taken into consideration in due time. The first business which necessitated the present meeting was the confirmation of the following resolution passed at the extraordinary general meeting on the 14th ult.: "That the capital of the Company be increased to £840,150 by the issue of 13,203 registered new shares of £10 each." With the addition of £118,515 this represented the amount which was to be divided among the proprietors by means of calls on their shares, as he had explained at previous meetings. The requisite forms had been prepared. There were a series of them; and he hoped they would be perfectly intelligible to everyone, so that it would not be necessary to follow up their issue by much, if any, correspondence. He concluded by moving the confirmation of the foregoing resolution.

Mr. H. SOLOMON seconded the motion, which was unanimously carried.

The CHAIRMAN observed that, before proceeding to the other business on the notice paper, there was a resolution which he had great pleasure in moving. It was a resolution which was usually passed at the annual meeting; but the proceedings at the last meeting being somewhat singular, he was not, as would be remembered, in the chair at the close, and the matter was consequently overlooked. He would, therefore, now propose that the thanks of the meeting be presented to the Secretary, the Engineers and Managers, and the staff in general, both in London and France, for the zealous performance of their duties. It would, the Chairman remarked, be difficult to find a staff more capable and competent than theirs for the work entrusted to them. He said this more especially with regard to the London staff, as they were most known to the shareholders; but it would, he assured them, apply in the same measure to the staff abroad. Their Managers (who were all foreigners) were very able men, and understood the customs of the country in which the Company's business was carried on. The men whom they took into their employ they endeavoured to promote to superior stations as vacancies occurred. They were, however, constantly receiving applications from young men in France for situations; but they were precluded from serving the Company when they were not trained on its works. The Directors preferred the men they raised in their own undertakings; and it was owing to this in a great degree that the success of the Company had been as continuous as it had proved, and had culminated in the business which had brought them together that day. He need hardly add, in connection with the question of the large bonus which the Directors were about to pay the shareholders, that they would certainly not forget the staff; and it was his desire to bring the matter before the Board on an early opportunity, and to be as liberal towards their servants as the Directors had generally been in their dealings with them.

Mr. N. E. B. GAREY seconded the motion, which was carried with applause.

The SECRETARY, on behalf of the staff, warmly thanked the shareholders for the vote; and he took the opportunity of saying how heartily the employees, both in London and abroad, endorsed the good wishes to Mr. Backler which were expressed at the last meeting. Many of the staff had worked for a number of years with that gentleman; and they felt that no words were too strong to express their high admiration of him.

The next business before the meeting was "to receive the recommendation of the Committee appointed at the annual general meeting of the shareholders on the 14th ult.; and, if approved, to adopt the same."

The CHAIRMAN having vacated the chair, it was taken by

Mr. SOLOMON, who said that no one could have greater pleasure than himself in introducing the matter to be considered—that was the proposed testimonial to Mr. Backler. From his knowledge of that gentleman he could say that he had been a teacher in the true sense of the word to every member of the Board. His business capacity was such as very few could approach; and his uprightness and sincerity of conduct entitled him to all that it was intended to give him. In this he was sure every one would concur who knew Mr. Backler as he did.

Mr. R. HESKETH JONES said it would be in the recollection of the shareholders that at the last meeting a notice of motion was placed on the *agenda* paper in his (the speaker's) name, as follows: "That the long and valued services rendered by H. M'Lauchlan Backler, Esq., and the fostering care and attention which he has given to the affairs of this Company, deserve to be specially recognized at this time, when the prosperity of the Company admits of a substantial distribution of its accumulated profits among the shareholders. Resolved—That a small Committee be appointed by this meeting to consider and recommend to the shareholders at the next meeting of the Company the most suitable and acceptable testimonial to Mr. Backler." This resolution was carried; and a small Committee was appointed, consisting of Messrs. Dodgson, Solomon, Cooper, Coppen, Smith, Harrison, Garey, and himself. The Committee met: and they resolved on presenting Mr. Backler with the following address:—

The shareholders of the European Gas Company, Limited, in recognition of the long and valued services rendered by Henry M'Lauchlan Backler, Esq., and the fostering care and attention which he has given to their affairs, resolved, at a meeting held on the 11th of August, 1890, to request his acceptance of the sum of one thousand guineas.

The Committee entrusted with the presentation desire to place on record that his services have extended over a period of 40 years, during which time the business of the Company has increased more than sevenfold and the rates of dividend threefold.

The shareholders recognize how much this prosperity is due to his untiring exertions, coupled with the great experience and wise judgment he has shown in the management of the Company; while, on critical occasions, he has not hesitated to risk his life in furthering the Company's interests.

His genial and conciliatory manner has endeared him to every person connected with the Company; so that the Committee feel they are recording the unanimous wish of shareholders and employees when they express the hope, as they do most sincerely, that his connection with the Company may long continue with the attendant blessings of peace, health, and happiness.

Proceeding, Mr. Jones said that his duty was a very simple one. Many shareholders had already expressed their great appreciation (which, he believed, they all felt) of Mr. Backler's services, and this short address to him emphasized those expressions. In conclusion, he moved that the address which he had read be accepted and presented to Mr. Backler.

Mr. O. B. C. HARRISON seconded the motion, and supported the remarks made by the mover.

A cheque for 1000 guineas having been signed by the Directors,

Mr. JONES (addressing Mr. Backler) said: In the name of the shareholders of the European Gas Company, I have much pleasure in presenting you with this illuminated address, together with a cheque for 1000 guineas.

Mr. BACKLER, in the course of his remarks in thanking the shareholders, said: After 40 years' experience of work in this Company (I entered it as a young man, as most of you know), I feel that the culminating point has arrived; and that the sentiments which have been expressed are those which come direct to my own heart. An old veteran like myself in business must be supposed, and generally is be supposed, to have but little if any sentiment left in him; but if that be the case generally, I can assure you it is not so with me—for I conceive that sentiment and business are not at all incompatible; and I further conceive, as regards my own individuality, that sentiment will overcome business in many of the phases of life. When I look back through that long vista of 40 years, and bring to mind those who have been associated with me either as colleagues or in the work of the Company in various grades, it seems to me as if it were a vast cemetery. In the London staff and in the management of the Company in London and abroad, there is not one left who held any position when I first took part in its proceedings. Well, the address which Mr. Jones has read is very emphatic in many of its expressions; and there is one which especially struck me—that expressing the hope that I may long continue to serve the Company. I must say that I am afflicted by a wasting disease; and it is with the greatest difficulty that I am able to keep my health at the standard which is necessary to continue efficiciently the duties which I wish to perform as long as strength is left me. Whether my time be long or short (I am afraid it can be but short), there is one thing which will ever remain in my memory as one of the brightest of the recollections of my life; and that will be the proceedings of this day. I feel that I have real friends in this Company; and if I have devoted my life to its success (a success which I foresaw was not only possible but probable when I first entered it), I am rewarded by seeing that the success is not only a monetary one, but that it has secured me the esteem and affection of those who have shared in it. I should find it exceedingly difficult to express adequately all that is passing at the moment in my mind. I do feel very strongly that sentiment must predominate in such a mind as mine; and I cannot give way entirely to business considerations, nor can I conceal my feelings. On the contrary, I wish to express them as strongly as I feel them. I thank you very heartily for the address. It is really a most beautiful thing in itself. It is designed with the most artistic taste; and executed with the greatest talent. It will indeed be a pleasant thought to me whenever I look upon it, to recollect how it was given to me. With regard to the cheque which I hold in my hand, I can only say that I have been so busy all my life making money for others that I have not had much time to make a great deal for myself. Therefore I am very pleased indeed to receive it. You may depend upon it that, so long as I can be of any service to the Company, my heart will be with it, as it has been in the past. With regard to the staff (I do not omit anyone, but I refer especially to Mr. Williams as the head of the London office), it is a great comfort for me to know that, when I disappear from the scene, I shall leave behind a staff most competent to carry on the business in the traditions of the past; and you may be assured of a continuance of that prosperity which it has been my pleasure to try and secure during the last 40 years. I thank you for the way you have treated me all through that time; and I may say that, if I am spared longer, I shall do all in my power to have a repetition of the business which we have brought to a close to-day.

Mr. SOLOMON said he deeply regretted to hear Mr. Backler speak so much as to the state of his health. He had hoped that his health had been quite restored; and that they would have the benefit of his services for many years to come.

The proceedings then terminated.

Reduction in the Price of Water at Sowerby Bridge.—At the last meeting of the Sowerby Bridge Local Board, Alderman Greenwood took up the question of the reduction of the price of water, which had been deferred from the last meeting. He proposed—"That the price of water be reduced from the 1st of October, by allowing the following discounts: On water accounts paid by owners, at present compounded for, 15 per cent., in place of the 10 per cent. now allowed; on water accounts of under £1 per quarter, paid by occupiers, 10 per cent.; on water accounts of over £1, and under £4, 15 per cent.; and on water accounts of over £4 per quarter, 20 per cent.; these discounts to be subject to the accounts being paid within 28 days from the delivery of the notes." A desire was expressed that the reduction should take effect from the 1st ult.; but eventually the motion was carried.

CONTINENTAL UNION GAS COMPANY, LIMITED.

An Extraordinary General Meeting of this Company was held last Tuesday, at the London Offices, No. 7, Drapers' Gardens, E.C.—Mr. H. M'LAUCHLAN BACKLER in the chair—to consider, and, if thought expedient, to pass a resolution or resolutions altering the Articles of Association, by adding thereto the following clauses, with or without variation:—

11*a*. The Company may from time to time by special resolution reduce its capital by paying off or returning capital not needed, or writing off capital, or by reducing the liability on its shares, or any part of them, or otherwise, as may seem expedient.

11*b*. The Company may from time to time, by extraordinary resolution, convert any paid-up shares into stock, and, when any shares have been so converted, the holders may thenceforth transfer their interests therein, or any part thereof, in the same manner, and subject to the same regulations, in and subject to which shares may be transferred, or as near thereto as circumstances may admit, but so that a fraction of a pound shall not be dealt with, without special leave of the Board.

11*c*. The stock shall confer on the holders thereof respectively the same privileges and advantages, as regards participation in profits, and voting at meetings, and for other purposes, as would have been conferred by shares of equal amount paid up in the capital of the Company, but so that, except as regards participation in profits, this shall not apply to aliquot parts of stock of such amounts as would not if existing in shares have conferred such privileges or advantages.

11*d*. Save as provided by the two last foregoing Articles, all the provisions of the Articles of Association shall, so far as circumstances will admit, apply to stock as well as to shares; and no conversion shall affect or prejudice any preference or preferential rights.

The SECRETARY (Mr. F. W. Himing) having read the notice convening the meeting,

The CHAIRMAN said it was his office that day to explain to the shareholders the reason for the notice which had just been read with regard to the proposed alteration of the regulations of the Company. The alterations were required by the state of the joint-stock law, which he held to be in an extremely confused state. In fact, he might say that he considered the joint-stock law of the country to be a disgrace to the Legislature; for it had become so complicated in course of time by the various amendments made, that it was difficult, he believed, even for a counsel or a solicitor, and much more so for a layman such as he, to understand it without a great deal of study. In the present session there were no less than three Bills in Parliament affecting joint-stock companies. What was to become of them he did not know; but he understood that one of them had disappeared altogether. However, it was possible that all three might eventually be passed; adding a few more steps to the difficulty of ascertaining what actually was the law on any particular point concerning joint-stock companies. Now, the Directors were obliged, in order to carry out a very simple thing, to alter the Company's regulations, which their Solicitors drafted for them, and which the Board conceived at one time to be very good, but which had been altered in their application by changes in the law itself, and by which they were obliged to abide. Therefore the shareholders had been summoned together that day to approve of the alterations which appeared necessary; and it was proposed to ask them to meet again on the 27th inst. to confirm the resolution if adopted. With regard to the reason for these alterations, what it was wished to do was to simplify the share capital of the Company, and to do this in such a manner as to satisfy the just requirements of the holders of shares which were only partly paid. At present the Directors saw no probability of any need for new capital. They had very considerable funds invested, the command of which was easy if they should require any. But he did not think this likely; and he believed the investments would be preserved without any call upon them. Besides this all the debentures had been paid off; and therefore they did not need anything as a guarantee to the debenture holders. Therefore, so far as the Board could see, there would be no requirement for the £6 per share which remained unpaid on the £20 shares. If this proved to be the case (as the Directors thought it would), where was the use of continuing the liability? The holders of shares £14 paid would be very glad to leave matters as they were, if there were any prospect of the £14 paid being increased to £20—that was, a call being made, so that they might receive 13 per cent. dividend, the same as the holders of the paid-up shares. But the probability of this having now passed away, the holders were inclined to complain of the contingent liability of £6; and they would gladly see this cancelled. The Board therefore proposed to convert into stock the whole of the ordinary capital, whether paid up capital (£20 per share), or £20 shares with £14 only paid. The advantage of this would be that the stock would be transferable, instead of in amounts of £20 or one share, in amounts of not less than £1. This would undoubtedly be a great convenience to the shareholders in dealing with the Company's securities. He would also call attention to the advantage to individual shareholders who wanted to part with their shares. With such a small number as they had of the £14 paid shares, it was not easy for a holder to sell—there was no market, in fact. When a holder of these shares desired to sell, he was obliged to go to the Stock Exchange. A very wide price was made; and the holder had to part with his shares at a loss. If the alterations were passed, they would only have to deal with a large amount of stock; and then the position of a small holder of £14 paid shares would be entirely changed. He would be a stockholder in common with all the stockholders; and he could sell £1 of stock if he chose, or £100,000 if he had the fortune to possess so large an amount in the Company. He (the Chairman) thought he had shown that there would be a great advantage in doing what was now proposed. It would meet the views alike of the paid-up shareholders, of those who had £14 paid on their shares, and of the Stock Exchange, as being much more simple, as it would reduce the classes of shares to two—that was, the preferential stock (which must, of course, be kept separately), and the ordinary stock, in which would be merged the £14 paid shares. Besides the foregoing advantages, there would be some benefit in the office, as it would save a great amount of trouble, and the office work would be simplified, and perhaps performed less expensively. Having made these remarks, he wished to move that the proposed alterations in the regulations (which were merely preliminary to the step he had indicated) be approved.

Mr. H. SOLOMON seconded the motion.

Mr. BAWDEN said that clause 11*a* stated that the Company might, from time to time, by special resolution, reduce the capital by paying off or returning capital not needed, or writing off capital, or by reducing the liability on the shares or any part of them, or otherwise, as might seem expedient. He would like to know what this meant. Taking the £20 shares, he saw no objection to converting them into stock; nor could he see any objection to making the £14 paid shares fully paid. But he did not think the proprietors should give the Directors power to pay off any portion of the shares at par; seeing that some of those who held £20 shares had had to pay as much as £48 or £49 for them, which roughly amounted to 240 per cent. Then, if the Board said they would never exercise this power, what was the use of possessing it?

The CHAIRMAN said that the wording of the clause had not the effect imagined by Mr. Bawden; it did not give to the Board the power he had referred to. It said that "the Company may from time to time by special resolution"—not the Directors, but "the Company," which meant an assembly of shareholders. Besides nothing could be done without a "special resolution," which would have to be passed by the shareholders at two meetings. No step of the kind inferred by the honourable proprietor could be adopted by the Board; it must be the act of the shareholders themselves. This disposed of the principal objection; but he would go a little further into the matter. With regard to the Company themselves giving the Board power to do that which it was assumed the Board might do of their own will—pay off or return capital if needed—it would be seen that it was not needed. If they had a large amount of capital realized either by the sale of the Union des Gaz shares or a portion of them, and they did not know what to do with that capital, it stood to reason they would be obliged to put it into some safe investment—either Consols or some other Government security—by which they would get something under 3 per cent. Now, if this were to arise on a large scale (he did not say on a limited scale, because it was well they should have the command of a considerable sum of money at any time, especially as they would not need any uncalled capital), would it not be better that the shareholders should have the command of their capital and realize—it could not be less than—3 per cent., than that it should remain in the hands of the Company at 3 per cent.? Therefore it was in the interests of the shareholders that this clause 11*a* was framed, so that they might have a voice in doing what they pleased with their own. Mr. Bawden had misapprehended the meaning of the clause altogether; but it was in the hands of the proprietors to alter as they liked. The present regulations, as framed, gave the Directors the power in question already; and it was only to make it quite clear that the alterations were in conformity with the existing articles that they had had this clause inserted. He might say that the regulations of the Company gave very extensive powers to the Directors; and if they had worded this section as the general regulations were worded, and in the same spirit, they would have been able to do what the honourable proprietor thought they intended doing.

Mr. STEVENS inquired if there was any probability of the shares of the Union des Gaz being paid off.

The CHAIRMAN said there was not at present.

In the course of further discussion,

Mr. BAWDEN said he should be prepared to propose an amendment, if his co-proprietors thought it right, to the effect that the portion of clause 11*a* giving the Board power to return capital should be eliminated. Having reiterated some of his previous arguments,

The CHAIRMAN said he thought it useless to continue the discussion; and he would ask those shareholders in favour of the adoption of the proposed alterations to signify their approval.

Only a few hands were held up. It was then pointed out to the Chairman that objection was only taken to clause 11*a*; and if it were amended as desired, the resolutions and alterations would be passed.

The CHAIRMAN, after consulting the Solicitor (Mr. Rew), said that rather than there should be any difference of opinion in the meeting, the Directors would try to meet the views of the shareholders.

A long conversational discussion ensued, which resulted in clause 11*a* being agreed to in the following form: "The Company may from time to time, by special resolution, reduce its capital by reducing the liability on its partly paid shares, or any part of them, as may seem expedient."

The alterations were then put to the meeting *en bloc*; and they were unanimously adopted.

Mr. BAWDEN then moved a vote of thanks to the Chairman for the conciliatory spirit he had evinced, and the proceedings terminated.

The Spiral System of Guiding Gasholders.—The tender of Messrs. R. and J. Dempster, of Manchester, for the construction of a gasholder on Messrs. Gadd and Mason's spiral system at the Middlewich Gas-Works, has been accepted.

The Lancashire Coal Trade.—The demand for most descriptions of coal continues fairly steady; but prices show some irregularity, owing to the advance which was marked in certain directions with the beginning of the month not being generally maintained. In fact, most sellers find a difficulty in securing the slight advance which was noted at the time; and it is not forced when there is a likelihood of business resulting. The holidays in various parts of the country have had an effect on the market as to engine fuel; and for medium qualities the tendency is in favour of buyers. Other descriptions sell fairly well, particularly for shipment; and had the South Wales dispute not been settled, there would have been a material improvement in prices to record. At the pit's mouth, steam and forge coal is quoted 8s. 6d. to 9s. per ton; and ordinary descriptions of steam coal delivered on the Mersey are quoted from 10s. to 10s. 6d. House-fire coal moves off well for the season of the year; and prices at the pits are 11s. 6d. for the better qualities and 10s. for seconds, with about 9s. for the commoner sorts. Burgy averages 7s. 6d. to 8s. per ton; slack ranging from 7s. 3d. down to 5s. 6d. per ton. Coke sells well, and where there is any change, it is in an upward direction.

PROVINCIAL GAS AND WATER COMPANIES.

The financial statements for the past six months of a large number of provincial gas and water companies have recently been issued, and in some cases the usual meetings of shareholders have already been held. From information supplied to us, we have extracted the particulars given in the subjoined paragraphs of the working of the several companies mentioned.

Gas Companies.

The half-yearly meeting of the Chatham and Rochester Gas Company has been held, and on the recommendation of the Directors, dividends at the rate of 10 per cent. per annum on the "A" and "E" shares and 7 per cent. on the "C" and "D" shares have been declared. The total income for the six months amounted to £23,339; and the total expenditure, to £20,466. It was stated that a large new gasholder at Rochester would be completed before the next meeting, and that contracts for the disposal of tar and coke had been entered into on better terms.

The half-yearly report and balance-sheet of the Haslingden Union Gas Company has been circulated among the shareholders. The balance of profit allows of a dividend of 9 per cent. on the "A" shares and 7½ per cent. on the "B" shares; and regret is expressed by the Directors that they cannot recommend the maximum dividend on the "A" shares. Though the consumption of gas has largely increased, the rise in wages has more than counter-balanced it; and this and the higher price of coal accounts for the diminution in the balance available for dividend.

Addressing the shareholders at the half-yearly meeting of the Newport Gas Company yesterday week, the Chairman (Mr. E. J. Phillips) said that the Directors regarded their report as a very satisfactory one. They were able to pay the usual dividends out of the net earnings; but he regretted that in the coming half year, owing to the increased cost of labour and coal, they would not be in a position to do so. The advance in the expenses of working from these two causes amounted to 79 per cent. To meet the extra cost, the Board had decided to raise the price of gas by 2d. per 1000 cubic feet. This would produce £15,000; but the deficiency would still be £3000. During the half year, 1½ miles of new mains had been laid; and the quantity of gas manufactured was greater than that of the previous half year by 6½ million feet. The report was adopted; and the usual dividends at the rate of 5 per cent. on class "A," 3¾ per cent. on class "B," and 3½ per cent. on class "C" stock and shares were declared.

A very satisfactory account of the past half-year's working was given at the meeting of the Ossett Gas Company last Thursday. The profits enabled the Directors to pay the full statutory dividends of 10 and 7 per cent., and to carry forward a fair balance. It was stated that a new large gasholder was expected to be ready for use in the coming winter; and that, in consequence of the increased cost of coal, the price of gas had been advanced from 2s. 6d. to 2s. 9d. per 1000 cubic feet.

The half-yearly general meeting of the Scarborough Gas Company was held on the 9th inst.—Mr. B. Fowler in the chair. The report presented stated that there had been an increased revenue from the sale of gas and residual products; and that there was a sum of £6102 available for dividend, which the Directors recommended should be at the maximum rates. This would leave a balance of £961 to the good. The Directors have had to raise the price of gas 3d. per 1000 cubic feet from the commencement of the current quarter. The new gasholder, which has been in course of erection since April last, is nearly ready for use; and for the purpose of meeting the balance on this account, and providing for current extensions, the remaining borrowing powers of the Company—viz., £4983—are to be put in force. The Chairman, in moving the adoption of the report, referred generally to the progress of the undertaking; and, alluding specially to the advance in the price of gas, said that the coal contracts were much higher now than when the charge was lowered in 1888. He expressed the hope that the advance would not continue long. With regard to the extension of the Company's operations, he said the Manager (Mr. W. J. Moon) was pushing the stove business as much as possible, and giving every facility to the public, not only with these appliances but also in the choice of burners. This had been done because the Directors felt that a large quantity of gas was consumed by bad burners. The report was adopted; and resolutions were passed sanctioning the payment of the dividends recommended, and the exercise of the remaining borrowing powers of the Company. On the retiring Directors presenting themselves for re-election, Dr. Jackson, one of the number, explained that although he was formerly the largest shareholder in the Company, during the last year or two he had been obliged to dispose of all his shares with the exception of £75 worth. This action might, he said, be regarded by some people as indicating a want of confidence on his part; but this was still as unabated as ever. A shareholder thereupon moved, by way of amendment, that the number of Directors be reduced by one; expressing the opinion that it was unwise on Dr. Jackson's part to wish to continue on the Board under the altered circumstances. The amendment did not, however, find a seconder; and Dr. Jackson was re-elected. Subsequently the sum of £200 was voted to the Directors (nine in all) for their services.

On Monday of last week, the half-yearly meeting of the Wakefield Gas Company was held, when the Chairman (Mr. W. Statter), in moving the adoption of the report and accounts, stated that the amount available for dividend was £5945. The Directors, he mentioned, had found it necessary to advance the price of gas by 2d. per 1000 cubic feet. The total expenditure for the six months was £10,628, or £2433 more than in the corresponding period of last year; and the balance of profit and loss was £5140, or £950 less than a year ago. The total income was £15,769, or £1482 more than a year ago. Mr. G. Haigh, the Deputy-Chairman, seconded the motion; and it was carried. The usual dividends of 11½ per cent. on the old shares, 9 per cent. on the £5 "B fifths," and £8 10s. on the new £10 shares were ordered to be paid; leaving a balance of £741 to carry forward.

The report presented by the Directors of the York United Gaslight Company at the half-yearly general meeting of the Company on the 7th inst., stated that in the six months ending June 30 last, there had been an increase of 2½ per cent. in the sales of gas, as compared with the corresponding period of 1889. As in the case of other gas companies, the rise in the price of coals and in the cost of many items of gas manufacture was seriously interfering with the profits; nevertheless there was a sum of £7047 available for division, and they expressed their pleasure that the financial results of the half year did not necessitate any advance in the price of gas. The Directors recommended the payment of the usual dividends of 5s. per share on the old, and 4s. 6d. per share on the new shares. The report having been read by the Secretary and Manager (Mr. Charles Sellers), its adoption was moved by the Chairman (Mr. J. F. Taylor), who referred to the anxieties the Directors had lately experienced, in common with those of other gas undertakings, owing to the unexpected rise in the price of coal. However, he was glad to say that their last coal contract was settled at a lower rate than the one they had to make at the beginning of the year. He was also pleased that the proprietors would receive an undiminished dividend. In the course of further remarks, the Chairman stated that coke had kept its position and popularity in the city. They had now machinery for breaking and screening it, and they had effected various improvements for economizing labour and perfecting their system generally. Taking their works as a whole, they compared with any in the country for regularity, convenience, and the despatch of business. He ventured to claim, too, that they had the strictest economy practised; for they had a vigilant Manager, who kept his eye always open to what was necessary for the welfare of the Company. The report was adopted; and the dividends recommended were declared.

Water Companies.

The report of the Directors of the South Staffordshire Water-Works Company, to be presented at the meeting of shareholders on the 28th inst., states that the number of houses supplied during the half year ended June 30 last was 1302; making the total number 70,417. The gross amount of water-rates for the six months was £36,244, as against £35,100 in the corresponding period of the previous year. After providing for interest on debenture and preference stock, the amount remaining for division (including £1596 12s. 8d., the balance brought forward) is £15,738; and the Directors recommend the declaration of a dividend for the half year on the ordinary stock at the rate of 5½ per cent. per annum, less income-tax. The amount of the dividend being £14,104, there remains £1634 to the credit of the current half year.

The proprietors of the Stockport District Water Company held their half-yearly meeting yesterday week. It was reported that there had been received by way of water-rental during the six months £7953; for supplies by meter, £3725; from the Alderley district, £1229; for the Bredbury supply, £226; and for the Marple supply, £157. The expenditure included £1191 paid to the Manchester Corporation for water, and £183 for cleansing and re-sanding filters. After deducting £1144 interest on debentures, the profit for the half year was £7904, which sum, with £1374 16s. 2d. in hand, left a balance of £9279. A dividend at the rate of 6¼ per cent. per annum was declared.

Last Thursday, the half-yearly meeting of the Whitby Water Company was held. The statement of accounts showed that the amount received for water-rates was £1358, which is somewhat less than usual, owing to the increased number of unoccupied houses. The dividend declared amounted to £1600; being at the rate of 8 per cent. per annum. The Chairman informed the shareholders that another spring had been added to the reservoir; and there was now a copious supply of pure water, sufficient to meet almost any emergency.

The Directors of the Woking Water and Gas Company, in their report to be submitted to the shareholders on the 26th inst., state that the total expenditure on capital account up to June 30 last was £64,537. The revenue for the past half year was £1884; the expenditure, including depreciation, £806. The balance available for division is £984; and the Directors recommend the payment of an interim dividend at the rate of 3¼ per cent. per annum for the past six months, which will absorb £950. The Company's mains have been extended to Bisley Common, on the application of the National Rifle Association, and a substantial additional revenue has resulted. The Engineers (Messrs. J. Quick and Son, M.M. Inst. C.E.) report that the works are in good order, and that an increased quantity of water is being obtained from the well at Horsley.

At the half-yearly meeting of the York New Water-Works Company on the 7th inst., the Chairman (Mr. J. F. Taylor) devoted the principal portion of his address, in moving the adoption of the report, to an explanation of the position of the Company in regard to the Bradford Corporation water scheme, the Bill to authorize which has lately passed the House of Commons. He said that although practically the whole of the upper watershed of the River Nidd was now appropriated by Bradford, only 17 million gallons of water a day were abstracted; and for this quantity a reservoir would have to be constructed of a capacity to supply, during a drought of 180 days—a most exceptional period of drought—upwards of 8 million gallons of water a day to the stream by way of compensation. Further than this, the Company had two representatives on the Board of Management of the reservoir; so that the Board were satisfied with the results of their labours in this regard. He moved that dividends at the rates of 5, 9, and 6¼ per cent. per annum on the various classes of shares should be declared for the half year ending June 30 last; and this was agreed to.

The Gas and Water Supply of San Francisco.—The Gas and Water Inspector for San Francisco (Mr. J. Q. Brown) has lately issued his report for the year ending June 30 last. It shows that the highest weekly average illuminating power of gas furnished during the year by the San Francisco Gas Company was 17·89, and the lowest 17·10 candles. The city requires that the lowest power must be 17 candles. There were 2,787,700 cubic feet of gas furnished to public buildings, at a cost of $4878·48. For lighting the street lamps during the year, the city paid $210,924·94. The highest average illuminating power of the gas furnished by the Pacific Gas Improvement Company was 18·03, and the lowest 16·80 candles. This Company furnished 9,316,400 cubic feet of gas to the public buildings, at a cost of $16,303·68. The total amount paid to the Spring Valley Water Company for furnishing water to the city institutions and parks during the year was $76,957·65. The total cost for gas and water was $366,144·27.

LIVERPOOL UNITED GASLIGHT COMPANY.

The Directors of the above Company in their report to be submitted to the shareholders to-day, state that the total revenue during the year ended June 30 last was £523,281, and the expenditure, £413,082; leaving a surplus of £110,199, which has been transferred to the credit of profit and loss. After deducting the amount taken for payment of the dividend declared last February, and the interest on the bond and debenture debt, there remains a balance of £57,384, out of which the Directors recommend a dividend for the half year of 5 per cent. on the ordinary consolidated "A" stock, and 3½ per cent. on the 7 per cent. "B" stock. The Directors note that the cost of production of gas has been affected by the recent rise in the price of coals and the advance in the rate of wages. It is, therefore, matter for congratulation that, notwithstanding these adverse conditions, they do not anticipate it will be necessary to raise the price of gas during the current year. The revenue account shows that the 296,492 tons of coal used in the manufacture of gas cost £226,795, against £212,423 last year; while the wages bill was increased from £45,038 to £50,354. The whole expenses of manufacture advanced from £306,031 to £335,263; but old materials this year realized £1291 against £784 last year. The cost of repair, maintenance, and renewal of mains and service-pipes decreased from £17,522 to £15,900. The total expenditure (£413,082) was £28,838 more than last year. On the other side of the account, the sale of gas per meter (at 2s. 8d. per 1000 cubic feet) produced £365,740, against £358,309 in the previous year; while the receipts for public lamps were £47,477, against £47,202. In regard to the residual products, 116,937 tons of coke realized £40,260, compared with £30,411 last year; 4,708,595 gallons of tar, £29,280, as against £23,986; and 8,537,730 gallons of ammoniacal liquor, £28,688, as against £29,048. The aggregate receipts exceeded the total expenses by £110,199.

BROMLEY GAS CONSUMERS' COMPANY.

The report and accounts of the above Company for the half year ending June 30 last have been issued in view of the ordinary general meeting of shareholders to be held on the 28th inst. We learn from the report that the make of gas has augmented, as compared with the corresponding half of 1889, by upwards of 2 million cubic feet; and notwithstanding a large advance in the cost of labour, the increase in the gas-rental and improved receipts from residuals have resulted in producing a balance about £570 in excess of that shown in the accounts of June, 1889. The profit and loss account shows a balance of £4179 13s. 2d., which falls short by £496 14s. 10d. of that required to pay the usual dividends; and, in view of this fact, and the great uncertainty of the future as to cost of coal and labour, the Directors have raised the price of gas to the private consumers from 3s. to 3s. 3d. per 1000 cubic feet as from the 1st of July last. The Directors recommend dividends at the customary rate of 11 per cent. per annum on the 10 per cent. shares, and 8 per cent. per annum on the 7 per cent. shares—amounting together to £4676 8s.; and that the £496 14s. 10d. necessary to make up this amount should be taken from the reserve fund. The Directors remind the shareholders that the Company have not escaped the labour difficulties which so many similar undertakings have experienced; and the result of conceding certain demands suddenly made by the stokers last year under threats of an immediate strike, has been to increase the labour account of the two last winter quarters between 30 and 40 per cent., or more than 2d. per 1000 cubic feet of gas manufactured. This increase was mainly due to the introduction of eight-hour instead of twelve-hour shifts, which not only necessitates the employment of many extra men, but is not adapted to the requirements of the Company, however well it may work in larger concerns. The Directors, therefore, determined to revert to the twelve-hour shifts; and they lately offered the men in their employ an increase of 1s. per day to adopt this system. The offer, they regret to say, was refused by the men, probably under outside influence; and the Directors had no difficulty in replacing them with new hands at the extremely liberal rate of wages offered. Reference is made to the death, since the last meeting, of the Secretary and Manager (Mr. G. H. Osborn), who was connected with the Company for more than 35 years, and whose energy and ability in connection with the undertaking are duly recognized. The appointment of Mr. W. Woodward, formerly of Bury, as Engineer and Manager, and of Mr. H. W. Amos (who had been for many years in the Company's service as Chief Clerk) as Secretary, are also mentioned.

THE BOLTON CORPORATION COAL CONTRACTS.

At the last Monthly Meeting of the Bolton Town Council, Mr. Stredder drew attention to the fact that tenders for the supply of gas coal had been accepted from companies about whom they had previously had a large number of complaints. It was, he said, strange that the company or companies with whom they had had a great deal of trouble in the past should be the first to have their contracts accepted, and for the largest quantity of coal. In one case he found that the tender was printed in the same way as the old tenders, and was sent out by the Chairman of the Gas Committee with instructions to have the tender forwarded to him at the Gas Office. He protested against this; being of opinion that all the tenders should be sent through the Town Clerk to the Town Hall, the same as the others. He hoped the Chairman of the Gas Committee would see his way to have this carried out in the future. Again, with regard to the quality of the coal to be supplied. One of the companies was that of which the Gas Manager (Mr. W. Smith) gave them such a startling description in his previous complaints; and this company boldly stated in their tender that they would supply "exactly the same as hitherto supplied." Having in remembrance the complaints made as to the quality of coal supplied by this firm, he said the words quoted were not respectful to the Council, and certainly not in the best interests of the ratepayers. He would also like to ask the Chairman, who had scored out a complaint in the complaint-book, about the inferior quality of some coal supplied; and also if the Chairman had ever given instructions that no complaints were to be entered in the complaint-book. Alderman Miles (the Chairman of the Committee) replied at considerable length. He said that he had neither struck out the entry nor ordered this to be done. The attention of the Committee was called to the scored-out entry; and the Manager reported that on finding that the entry had been made by a man in the weighing office, he went to see the coal. Ascertaining that the complaint was unjustified, the Manager himself crossed out the entry. The fact was Mr. Stredder had found a "mare's nest;" and it would be as well if that gentleman made due inquiries before bringing such matters before the Council. As to the other questions raised, he said he had not given any instructions that complaints should not be entered in the books kept for the purpose; his sole instruction was that no goods of any kind should enter the Bolton Gas-Works which were inferior in quality to those tendered for. As to the tenders, it was quite true they came directed to him; but he did not open them. They were all opened in the presence of the Committee, in accordance with a practice which had prevailed for many years. Nothing was done without the consent of the Committee. They had made contracts for 50,000 tons of coal at 11s. 1¾d. per ton, or a saving of 6d. per ton on what was paid for 10,500 tons in March last. By waiting, they had secured this saving; and part of the credit for it was due to the Manager, who strongly advised the Committee in March to wait before buying.

METROPOLIS WATER SUPPLY.

The Areas of the London Water Companies.

As mentioned in our article on "Water and Sanitary Affairs" last week, the report of the Official Water Examiner for the Metropolis (General A. de Courcy Scott) for June—the latest issued—contains an interesting table showing the relative importance of the work of water supply undertaken by the Metropolitan Companies within and beyond the area of the county of London. The table is based mainly on information which the Directors have been good enough to furnish; and as the figures contained therein are of special value at the present juncture, we reproduce it below. General Scott remarks that the statistics would have been more complete if the relative quantities of water required for trade purposes could have been included; but, unfortunately, no data exist for making a comparison of these items of supply. In other respects the figures are a fairly close approximation to the facts actually existing at the close of the past year.

—	Population.		Number of Houses supplied.		Areas in Square Miles.	
	Intra-Metropolitan.	Extra-Metropolitan.	Intra-Metropolitan.	Extra-Metropolitan.	Intra-Metropolitan.	Extra-Metropolitan.
Chelsea	277,403	—	35,226	—	5·0	—
East London . .	806,962	442,650	97,000	65,000	13·5	66 00
Grand Junction .	354,916	148,708	34,626	21,244	6·5	40·00
Kent	343,200	93,252	57,200	15,542	30·0	147·00
Lambeth. . . .	449,897	181,566	64,271	25,938	25·0	36·50
New River . . .	1,024,000	124,000	132,393	20,745	16·0	77·00
South. and Vaux. .	804,460	28,560	107,528	4,280	21·0	8·75
West Middlesex .	436,320	107,895	58,176	14,386	9·5	17·50
Totals . . .	4,497,158	1,126,631	586,4.0	167,135	126·5	392·75
	Deduct for areas supplied in common, and twice entered .				5·0	
					121·5	

General Scott points out that the total area ascribed to each Company does not correspond to the area within which each has powers of supply by statute. In fact, the statutory areas overlap; and the Companies have found it necessary to agree as to common boundaries of supply. The area exhibited may perhaps be most correctly defined as the statutory area decreased by areas assigned to adjoining Companies by agreement or common understanding, and also in some cases by areas not yet entered into by the Company in consequence of the sparseness of the population, or from other causes. It may be stated, as an instance in point, that an area of 53½ square miles within the statutory district of the East London Company has been excluded from the tabular area assigned to the Company for the reasons above mentioned. The mains of this Company would be further extended to include 47 square miles outside the Metropolis, if the population increased sufficiently to warrant such a course. It will be observed that considerably more than 1,100,000 persons living outside the Metropolitan area are supplied by the so-called Metropolitan Water Companies, and that the areas of supply outside the Metropolis have now more than three times the extent of the intra-Metropolitan area.

The Quality of the Water during the Month of July.

The returns furnished to the Registrar-General by the London Water Companies as to the water supply of the Metropolis during the past month, show that the average daily supply was 185,949,769 gallons; being at the rate of 31·2 gallons per head of the population, as compared with 31·7 gallons in July, 1889. Of the entire bulk of water sent out, 94,514,149 gallons were drawn from the Thames, and 91,435,620 gallons from the Lea and other sources. Reporting upon the quality of the supply, Dr. E. Frankland said: Taking the average amount of organic impurity contained in a given volume of the Kent Company's water during the nine years ending December, 1876, as unity, the proportional amount contained in an equal volume of water supplied by each of the Metropolitan Water Companies, and by the Tottenham Local Board of Health, was: Kent, 0·4; New River, 0·7; Colne Valley, 1·2; Tottenham, 1·3; East London, 1·5; Southwark, 1·7; West Middlesex, 1·8; Grand Junction, 1·9; Chelsea, 2·2; and Lambeth, 2·4. The water drawn from the Thames by the Chelsea, West Middlesex, Southwark, Grand Junction, and Lambeth Companies was, in every case,

efficiently filtered; and the improved quality which it has of late exhibited has been fully maintained. The water obtained chiefly from the River Lea by the New River and East London Companies was also efficiently filtered, and exhibited a high degree of organic purity; the New River Company's supply being again especially distinguished in this respect; the deep-well waters of the Kent and Colne Valley Companies and of the Tottenham Local Board of Health were, as usual, of great organic purity; that delivered by the Kent Company containing only mere traces of organic matter. These waters were clear and bright without filtration.

Barnet District Gas and Water Company.—In the report to be presented by the Directors of this Company at the half-yearly meeting on the 29th inst., they state that the balance of the profit and loss account amounts to £12,992, out of which the Directors recommend the declaration of a dividend, less income-tax, for the six months ending June 30 last at the rate of 7½ per cent. per annum on the "A" and "C" stocks, 6½ per cent. per annum on the "B" stock, and 5¾ per cent. per annum on the "D" (water) shares. The business of the Company is stated to be progressing very satisfactorily.

The Bolton Corporation Gas and Water Accounts.—From the annual abstract of accounts issued by the Treasurer to the Bolton Corporation (Mr. Swainson), some interesting figures are given regarding the Gas and Water Departments. The gas-works fund is one of the most important undertakings of the borough; and it is dealt with first in the abstract. The cost of gas manufactured during the past financial year was £49,669; salaries came to £4082; distribution cost £3634; rates, £2242; rents, £392; management, £1573; interest and annuities, £22,350; sinking fund, £1392; amount set apart to reserve fund £15,940. On the income side, the sale of gas realized £83,504, and residual products, £23,540. Other items brought the total receipts up to £111,518; leaving a balance of profit of £13,500, which was appropriated in aid of the rates. On capital account, the total assets are set down at £586,739; and the balance between floating assets and liabilities is £51,044. In the Water Department the income was £59,052; and a balance profit of £12,000 was handed over in relief of the rates. The capitalized total of liabilities is given as £743,340; and the balance between floating assets and liabilities against the fund is £9405. On revenue account, £1605 was paid in salaries, £3155 for the maintenance of works, £2397 for rates, and £1156 for rents. The amount received in water-rentals aggregated £48,442; showing a steady annual increase since 1881, when the sum was about £40,000.

Water Gas for Public Lighting at Harrogate.—In the JOURNAL last week, we briefly mentioned the inauguration of the experiment in public lighting by water gas at Harrogate, which is being carried on under the auspices and at the personal expense of the Mayor (Mr. Samson Fox), who is the Chairman of the British Water Gas Syndicate, Limited. The following are a few additional particulars which have reached us in regard to the experiment: For the purpose of the trial, a compact little plant was erected, of sufficient capacity to supply all the main streets of the borough. It consists of a generator, scrubber, gasholder, blower, governor, odorizing apparatus, and boiler; and the whole stands within a space of 40 feet square. It is unnecessary to describe here the process of making the gas; suffice it to say that the plant was put into operation, and enough gas produced to make a start with the lighting on the 6th inst. A main has been laid on either side of Parliament Street; and lamps have been put up, but not in such a way as to interfere with the ordinary gas-lanterns. They are placed at definite intervals; and at the top of the street, a large 400-candle power lamp is fixed. In this there are 24 jets; and it is capable of giving a light of 800 candles if necessary. On traversing the street, therefore, the relative merits of coal and water gas may be estimated. The burners used in the lamps are Bray's No. 3; each being surmounted by the small magnesia "comb" which is a necessary adjunct to the burner with this system of lighting. It is stated that, with a consumption of 5 cubic feet of gas per hour, a light equal to 22 candles is afforded. The combs will, it is believed, last 100 hours; and they cost 1½d. each. We understand that the gas for this experiment is being produced in precisely the same way as at the Leeds Forge and at Mr. Fox's residence, Grove House, where it has been for some time in use.

The Vyrnwy Water-Works.—Although, as already stated in the JOURNAL, the Vyrnwy Water-Works of the Liverpool Corporation are practically complete, the water cannot be conveyed into the city for some time; and, curiously enough, it has lately been necessary to put the inhabitants on a short supply. The difficulty does not lie with the works, but with the pipe-line, which has to be put into a proper condition to convey the water. The total amount expended on these great works up to June 30 last, was £2,025,815. The principal items going to make up this total are: Embankment and works in connection with the reservoir, £533,816; quarrying at Vyrnwy, £201,263; pipe-line, £979,599; and land and easements, £281,261. This gives a total of £1,995,944, of which £14,261 was expended during the first six months of the present year. To the cost of the works proper must be added £24,508, the charge for the "maintenance of the Vyrnwy estate;" and an additional £5363 has been spent on the Vyrnwy Hotel. Coming to details, the masonry dam has cost £335,015; permanent roads and bridges in connection with the reservoir, £53,799; temporary accommodation works, £17,419; machinery of all kinds, £21,453; miscellaneous plant, £12,257; horses, £9387; engineering, £26,645; travelling and office expenses, £26,520; and general expenses, £12,343. These are charges in connection with the reservoir and masonry dam only. In regard to other portions of the work, the actual cost of quarrying has been £156,324; £64,938 having been laid out in providing the necessary machinery and plant, offices, &c. The main item in connection with the pipe-line is the charge of £457,139 for cast-iron pipes and tubes; next to this comes £130,244 for pipe-laying, £91,057 for the Vyrnwy tower and Hirnant tunnel; and £60,075 for the Oswestry reservoir and filter-beds. The main item of charge at present is the Mersey crossing, which involved up to the above-named date an expenditure of £3553. It is, however, far from completion.

NOTES FROM SCOTLAND.

From our Edinburgh Correspondent.

EDINBURGH, *Saturday*.

The holiday season is now in full swing. Nearly all the gas companies, great and small (and there are a great many small ones in my district), have declared their dividend; closing up a year which has been a most brilliant record nearly all round. Both revenues and outputs are larger than ever, and the outlook is only affected prejudicially by the shadow of harder times in the current year consequent upon the rise in the price of coal. So far as the gas industry is concerned, this is the only fly in the pot of ointment; and its effect has been to necessitate a general rise in the price of gas. The outlook is, however, not altogether dark; for there are hopes, not unreasonably founded, that easier times will soon be experienced, and revenue will again show better than expenditure. In this connection it is curious to observe that promoters of electric lighting business do not yet seem to have felt the pinch. One would expect that a rise in the price of coal would affect their outlay to an extent sufficient to require an increase in the charge for light. Nobody, I am sure, would be more ready than they, did they feel it, to set up a pitiful cry on the subject; and the fact that they have not yet begun to "give mouth" in that line, I take to indicate that they are not doing sufficient business to be affected by a rise or fall in the price of coal. It is instructive to compare the values of the two illuminants in the light of this circumstance. The one is universally used, and is at once affected by a rise or fall in the price of materials; the other is held up to us by its votaries as being a great institution, and yet it remains unaffected by the price of one of the prime necessities of its existence. The conclusion is therefore forced upon one that its use must be very restricted indeed. The two lights are frequently spoken of as rivals; but what rivalry can there be between concerns so widely different in magnitude? The idea of the increasingly popular gas light competing with the electric light, struggling to obtain a footing, is absurd.

The increase of 3d. per 1000 cubic feet in the price of gas in Edinburgh is being made the occasion of some grumbling; but the amount of discontent is really so trifling as to be almost unworthy of notice. The leading grumblers as yet have been a community calling themselves the Morningside Merchants' Association—a body altogether unknown, but whose potentiality for giving trouble may not, for all that, be inconsiderable. They met on Tuesday night to consider their policy; and it is said they had statistics before them which showed that in Edinburgh the price of gas is higher than in other large cities. Upon this information they resolved to protest against the increase, and to communicate with other associations with the view of bringing united pressure to bear upon the Gas Commissioners. It is according to their success in this rousing of other bodies that will depend whether the future history of this movement will be written or not. It is as likely not to be as to be, because it is most probable that about the last has been heard of the movement. Had, however, the Gas Commissioners explained their reasons for raising the price, it is more than possible there would have been no cavilling at their action.

A difficulty has arisen between the War Office and the Police Commissioners of Inverness with reference to the water supply to the barracks, in which the former look like having the worst of the battle. The barracks are supplied with water by meter, at a charge of 6d. per 1000 gallons. Several months ago the Water Manager reported that the meter was defective, and was only registering one-third of the water that passed through it. The attention of the War Office was called to this; and they were asked to replace the meter. This the authorities at the War Office have declined to do; and this week the Police Commissioners, by 13 to 2 votes, resolved to cut off the water supply.

From our Glasgow Correspondent.

GLASGOW, *Saturday*.

Apropos of my "Note" last week in reference to the price of gas coal, one of the representatives of an extensive coal concern in Glasgow tells me that my statements generally were very correct; and he has not ventured to contradict any one of them. He further says, in reference to the additional supply required by the Glasgow Corporation Gas Committee, that the quality of coal that must be purchased in order to obtain gas having an illuminating power of 22 standard candles can only be secured at an advance of at least 3s. 6d. above the price ruling for such coal a year ago. If this be correct, and if it likewise be true that the requirements for the current year amount to 150,000 tons of coal, then there will be an excess outlay of £26,250 for that additional quantity of coal. But there is also the alleged average advance of 2s. 6d. per ton on the quantity of coal already purchased, which may be set down roughly at 180,000 tons. This gives another excess outlay for coal, amounting to £22,500; and the total increased cost will be something like £48,750, or within a comparative trifle of £50,000. Any gas-supply concern that can stand such an increased cost for its coal, and not require any addition to be made to the selling price of the commodity to the consumers, must be in a very flourishing and buoyant condition, and exceedingly well managed. That the Glasgow gas undertaking is well managed goes without saying.

The Gas Committee of the Hamilton Town Council have been authorized to accept an offer from the Glasgow Alum and Ammonia Company, Limited, for the purchase of the tar and ammoniacal liquor produced at the gas-works during the current year; and also to pay off at Martinmas next £2000 of the debt on the works. At the recent Council meeting, the Provost said, with reference to the secondary products contract, it was satisfactory that not only were last year's good prices maintained, but there would be something like an increased income from them of £200, or perhaps more.

The Gas Committee of the Greenock Police Board of that town, at a meeting held on Thursday night, declined, by a majority, to recommend that the price of gas be reduced 2½d. per 1000 cubic feet—from 3s. 4d. to 3s. 1½d. Some members of the Committee who were of opinion that a reduction in price should be made, thought that a reduction of 1½d. per 1000 feet would be sufficient. To reduce the price by the major amount would, it is said, sweep away the whole of this year's estimated

surplus of £1500, and leave a balance on the wrong side. Again, there is an unsettled question between the Harbour Trust and the Gas Trust as to the proportion of feu duties at Inchgreen, where the gas-works are situated; and it is said that a payment of £400 or £500 may have to be made under that head during the current year. It is also alleged that a new gasholder is required; and that some provision must be made for defraying the cost thereof. Of course, interest and sinking fund payments will be sufficient to put this matter on a sound footing for a series of years. But the question is asked: "Are the consumers of gas to get nothing out of the surplus of profit over expenditure to the extent of £3500 for the past financial year?" It is further asked: "Are they to burn gas and increase the consumption of it at the old rate, so that those who do not burn a cubic foot of it in the year may have their police rates reduced by a sum of money almost equal to 3d. per pound of rental?" The whole subject will shortly come before a meeting of the Gas Trust; and it is hoped that these and other consideration will have some weight in deciding that a reduction of at least 1½d., if not 2½d., be made in the price of gas.

The Stirling Water Commissioners have lately had before them a little difficulty with the local Gas Company in reference to the charge for the water required for a new gasholder tank—about 400,000 gallons. The Clerk had volunteered the explanation that at the meter rate the charge would amount to £13 13s. 4d. Mr. Colquhoun remarked that the Gas Company had, on a former occasion, obtained water for a similar purpose at a reduction from the ordinary meter rate; but the Clerk failed to see any reason for doing so again. He said that the Company was a trading concern, and had no hesitation in raising the price of gas when coals increased a little in price, and asked why should the public sell their water any cheaper to them? This pertinent query was replied to by Provost Yellowlees, who stated that other considerations entered into it, that the Gas Company, in supplying gas to them as a community, made a reduction on the quantity they took; and it was quite right there should be some reduction made in the price of water charged to them.

At the Coatbridge Town Council meeting held last Monday, it was reported by the Fire and Lighting Committee that the Gas Company had declined to modify their offer to light the lamps of the burgh to 22s. 6d. and 27s. 6d. in the case of those burning 3 feet or 4 feet per hour respectively, which rates had been asked by the Committee. The Gas Company had asked 1s. more for each of the lamps having 3-feet burners. While the report was before the Council, Bailie Sharp stated that he had that morning had a meeting with several of the Directors, who said that the Company would agree to accept the contract on the Committee's terms, the contract to commence on Sept. 1. The Council resolved that the terms should be put in writing, and that the sum should include the erecting, taking down, and storing of the lanterns, as formerly; and they agreed to ratify the contract on that understanding.

There has been a marked degree of buoyancy in the Glasgow pig iron market this week. Not only have the brokers themselves been doing a big business, but the outside investing public have also been going in for warrants. Scotch iron has been in greatest request. The market has been oversold on outside account to an extent not known for some years. The price of Scotch iron advanced from 48s. 2d. to 48s. 10½d. per ton cash, and then relapsed to 47s. 4d. cash; ultimately, however, the price improved to 48s. 7½d. per ton. Cleveland iron was steady at the close yesterday at 45s. 3d. per ton cash, and hematite iron at the close was quoted at 56s. cash buyers.

The coal trade of Lanarkshire continues active. Some varieties of coal have been advanced in price 3d. per ton—the following being the current quotations: Splint coal, 9s. 6d. to 9s. 9d. per ton f.o.b.; main coal, 9s. to 9s. 3d.; steam coal, 10s. 9d. to 11s. 4d; ell coal, 9s. 9d. to 10s. 3d.

A local report of the sulphate of ammonia market for the past week says: The market this week has been firmer; and makers' stocks have been pretty well cleared out. Buyers are offering £11 8s. 9d.; but sellers hold for considerably more f.o.b. Leith. Business has been done for shipments at Glasgow at £11 12s. 6d. f.a.s, both for prompt and forward. The outlook is brighter than it has been for some time.

CURRENT SALES OF GAS PRODUCTS.

LIVERPOOL, *Aug.* 16.

Sulphate of Ammonia.—The demand, principally for American and Spanish account, continues on an extensive scale, and is likely to overtake the present small production. It is little to be wondered at, therefore, that values continue to harden; and there are now buyers at £11 10s. to £11 12s. 6d., according to quality f.o.b. Hull. At Liverpool the quotations are £11 12s. 6d. to £11 15s. according to strength; while Leith sulphate is worth £11 8s. 9d., and at Glasgow £11 13s. 9d. is being paid for 24½ per cent. sulphate in double bags. The American demand is now likely to be carried into September; and prices may further advance under the influence of these and Continental requirements. Stocks at the country ports are now reduced to a very low ebb; and they cannot, of course, increase materially for some time to come. The nitrate market has a firmer tone; and cargoes for Autumn shipment are moving off at full prices.

LONDON, *Aug.* 16.

Sulphate of Ammonia.—The position remains practically unchanged. A fair business has been done at £11 10s. to £11 12s. 6d.

Tar Products.—There has been a quiet week; no transactions of any importance having taken place. Prices quoted last week may be taken as to-day's values.

The Public Lighting of Newcastle.—At a meeting of the Newcastle City Lighting Committee held last Tuesday afternoon, it was resolved to recommend the Watch Committee to increase the supply to another 100 lamps, which are at present burning 5 cubic feet of gas per hour, to 10 cubic feet during the coming winter season. These lamps are nearly all situated in the principal streets. It was also determined to order that the four lamps at Grey's Monument—one at each corner—now burning 15 feet of gas, should be increased to 30 feet; thus materially improving the lighting at that place.

Yarmouth (I.W.) Water Supply.—A Company has been formed, under the title of the Freshwater and Yarmouth Water Company, Limited, with a capital of £7000, in 680 ordinary £10 shares and 20 founders' shares of similar amount, to carry on the business of a Water Company within the towns and parishes of Freshwater, Yarmouth, Thorley, and Shalfleet, in the Isle of Wight, in accordance with the provisions of the Freshwater and Yarmouth Water Order, 1887.

Artesian Bored Tube-Wells.—We learn that Messrs. C. Isler and Co., of London, have completed some artesian bored tube-wells on their improved principle at the works of the Kirkstall Brewery Company, Limited, of Leeds, where, for some time past, the supply has all but failed from the existing well. After reaching the depth of 160 feet from the surface, springs were struck yielding 6000 gallons of water per hour without reducing the head. Similar results were obtained at Mr. J. W. Wright's brewery at Armley, near Leeds. At Messrs. J. C. and J. Field's, of London, a continuous supply of more than 7000 gallons of water per hour is obtained from an artesian tube-well 404 feet deep. The Marquis of Salisbury has instructed the above-named firm to put down an artesian tube-well, 300 feet deep, and to fix pumps, engine, and boiler in connection therewith, on a site close to Hatfield, which town it has to supply.

The Sheffield Corporation and Electric Lighting.—The Parliamentary Powers Committee of the Sheffield Corporation have decided to arrange for a visit to Bradford to inspect the electric lighting works of the Corporation, early in September, and have requested the Town Clerk to report what steps are necessary to enable the Corporation to apply next session for a Provisional Order to supply electricity within the borough. The Water Committee, on the same subject, have resolved—"That, in view of the probability of the Corporation obtaining power to supply electricity for public and private purposes in the borough, this Committee desire to call attention to the water power connected with their several wheels on the Rivelin, and to suggest that any electrical engineer employed by the Corporation should put himself in communication with the Water Engineer (Mr. E. M. Eaton) for the purpose of ascertaining how far such power might be available for the purpose in question."

Electric Lighting Schemes for the City of London.—The Bill to confirm the Provisional Orders granted by the Board of Trade for the electric lighting of the City of London came last Friday before the Unopposed Bill Committee of the House of Commons. The preamble having been formally proved, the Orders were confirmed. As will be seen by our "Parliamentary Intelligence," the Bill was subsequently reported to the House, and the Orders contained therein passed. The City is divided into two parts for electric lighting purposes. The portion lying to the east of the Mansion House, Princes Street, and Moorgate Street is assigned to the Laing, Wharton, and Down Construction Syndicate; whilst a portion to the west of these points, as far as St. Paul's Churchyard, is assigned to the Brush Electrical Engineering Company. The Orders provide that electric lighting mains shall be laid in the principal thoroughfares of these two areas within 21 months from the passing of the Orders.

The Accrington Corporation and the Water Supply.—At a recent meeting of the Accrington Town Council, the Medical Officer of Health presented a report on the condition of the water supplied from the Burnley Road reservoir, in which he made certain recommendations with reference to the construction of the conduits, and the means taken for keeping them clean. Commenting upon these, Mr. Sprake said it was not satisfactory to the ratepayers that their representatives should be called upon by the Water Company to make practical suggestions for improving the state of the water, while the Company derived the profits made from its supply. He intended to give notice of motion that the Legal and Parliamentary Committee be instructed to inquire into the position of the Gas and Water Company with respect to their supply, and ascertain if it was practicable for the Corporation to take over the water supply without any interference with the gas supply. He thought it would be advisable in the interests of the ratepayers that they should have the control over the water.

The Position of the Warrington Water Company.—A report on the general position of the Warrington Water Company has lately been prepared by Mr. J. L. Tunstall, and presented to the Town Council. He states therein that he has examined the accounts of the Company for the three years ending Dec. 31, 1889; and that the last published balance-sheet exhibits, in his opinion, truly and correctly, the state of the Company's affairs at that date; also that the profits shown in the profit and loss accounts for the three years have been fairly earned. He is further of opinion that the fact of the Company having in their accounts made no provision, other than the reserve fund, for depreciation of plant and works does not affect the value of the undertaking, inasmuch as this value depends upon the earning power of the Company and the actual state of the plant and works; and that, provided these have been duly maintained, no provision for depreciation was necessary, more especially as the Company's property and rights as a whole have certainly not depreciated, but largely increased in value.

The Northern Coal Trade.—There has been an abnormal demand for coal in the North during the past week; but it has been due to the scarcity caused by the strike at Cardiff. The demand has been chiefly for steam coals, the best classes of which rose to about 15s. per ton free on board at the time of the strike; but they have now fallen to about 13s. per ton—the normal price. Small coals are firm, at about 7s. Bunker coals are steady; but have fallen off in price since the conclusion of the Welsh strike. Gas coals are quiet—the price varying from 11s. 6d. to 12s. per ton free on board; but it is reported that one lot was sold under exceptional circumstances at 13s. 6d. per ton for a cargo of about 800 tons. The pressure of the demand for gas coals for export seems to have passed now. But the inquiry for local use and for the great southern companies seems to be daily increasing; and the southern companies desire to take advantage of the period when the range of the steamship freights is low. Household coals are very dull; the warm weather lessening the usually small demand at this period of the year. Blast-furnace coke is also low in price—about 17s. 6d. per ton free on board. As yet there has been no change in the price of gas coke; but the production of this article is increasing, and it is possible the price to the cement makers may soon be reduced.

The Coze System at the Birkenhead Corporation Gas-Works.—At the last meeting of the Birkenhead Town Council, the tender of West's Gas Improvement Company, Limited, of Manchester, was confirmed for the supply of an engine and coal breaker, elevator, conveyor, and hopper, for Coze's patent system of inclined retort-settings at the gas-works.

The Proposed Improvement of the Sea-Front at Ramsgate.—A poll of the ratepayers of Ramsgate on the subject of the improvement of the sea-front, which it is proposed to carry out from the plans and under the supervision of Mr. W. A. Valon, Assoc. M. Inst. C.E., the Corporation Gas and Water Engineer, was taken last week, with the result that the scheme received the approval of a very large majority.

The Quality of the Gas at Maidstone.—The General Purposes and Gas Committee of the Maidstone Town Council having reported that the Borough Analyst has found the gas supplied in the town to be of deficient illuminating power on more than one occasion, the Council last Wednesday resolved to take legal proceedings against the Gas Company. The latter state that their testings do not agree with those o the Borough Analyst. f

The Inclined Retort System for Burnley.—At a meeting of the Gas Committee of the Burnley Corporation last Thursday, a discussion took place as to what style of retorts should be adopted in the proposed extension of the works. The Committee were unanimously in favour of the inclined system, with certain modifications upon those lately seen at the Southall Gas-Works. The Coze retorts are 11 feet long; the Coze-Morris retorts, 20 feet. The Committee decided to adopt an intermediate length of 15 feet. The method of charging was left open for the present.

Sale of Shares in the Westhoughton Gas Company.—At Westhoughton last Wednesday, 30 shares in the Westhoughton Gas Company were offered for sale; 15 being fully-paid £10 "A" shares (with a maximum dividend of 10 per cent.), 3 fully-paid £10 "B" shares (maximum dividend 7 per cent.), and 12 "B" shares, £5 paid. The first four "A" shares sold for £44; and the next six for £66 15s. Four others realized £45; and £22 7s. 6d. purchased two shares ("A" and "B"). Two "B" shares were sold for £22; and the 12 "B" shares, £5 paid up, found a purchaser at £66 17s. 6d.

Winding up of the Maxim-Weston Electric Company.—A special meeting of the Weston Electric Company was held last Thursday week, for the purpose of passing a winding-up resolution. Mr. J. P. Gooding, who presided, stated that as the shareholders were not disposed to subscribe more capital to carry on the work of the Company, they could not go on. He thought they had sufficient to pay their liabilities. He moved—"That it has been proved to the satisfaction of the meeting that the Company cannot, by reason of its liabilities, continue its business, and that it is advisable to wind up the same; and, accordingly, that the Company be wound up voluntarily." After some discussion, the resolution was passed.

Conviction for Stealing Gas at Worcester.—At the Worcester Police Court last Friday, Daniel Blakemore, a pianoforte dealer, of New Street, was charged with stealing 10 feet of gas, belonging to the Worcester Gas Company. On June 24 the condition of the meter was taken, and on July 3, one of the Company's officials called again to inspect the meter. He found that no gas had passed through the meter since the 24th of June. On Aug. 1 an official was passing defendant's premises, when he smelt gas escaping from the cellar. He went down into the cellar, and discovered that the meter had been disconnected from the pipes on both sides. A flexible pipe had been connected with the pipe on the side of the meter nearest the gas-main, and also with the pipe on the side of the meter supplying the premises. The whole of the gas was, therefore, passing direct from the Company's pipe to the house, without passing through the meter. The Bench fined defendant £5, and £1 10s. costs, or two months' hard labour.

GAS AND WATER COMPANIES' STOCK AND SHARE LIST.

(For Stock Market Intelligence, see ante, p. 391.

Issue.	Share	When ex-Dividend.	Dividend or Int. & Bonus.	NAME.	Paid per Share	Closing p'r. ces.	Rise or Fall in Wk.	Yield upon investment.
£			p. c.	GAS COMPANIES.				£ s. d.
590,000	10	16 Apr.	10½	Alliance & Dublin 10 p. c.	10	17—18	..	5 16 8
100,000	10	,,	7½	Do. 7 p. c.	10	12⅞—13¼	..	5 11 1
300,000	100	1 July	5	Australian (Sydney) 5 % Deb.	100	107—109	..	4 11 9
100,000	20	30 May	8	Bahia, Limited	20	20—22	..	7 5 5
200,000	5	15 May	7½	Bombay, Limited	5	7—7⅛	..	5 0 0
40,000	5	,,	7½	Do. New	4	5—5⅛	..	5 9 1
380,000	Stck.	14 Aug.	12½	Brentford Consolidated	100	212—217*	..	5 12 11
125,000	,,	,,	9½	Do. New	100	155—160*	..	5 15 7
220,000	20	13 Mar.	11	Brighton & Hove Original	20	40—42	..	5 4 9
320,000	20	28 Mar.	11½	British	20	4⅛—4⅝	..	5 0 0
50,000	10	13 Mar.	11	Bromley, Ordinary 10 p. c.	10	18—20	..	5 10 0
39,000	10	,,	8	Do. 7 p. c.	10	13—14	..	5 14 3
328,750	10	13 June	8	Buenos Ayres (New) Limited	10	12¾—13⅛	..	5 18 6
200,000	100	1 July	6	Do. 6 p. c. Deb.	100	103—100	..	5 13 2
150,000	20	14 Aug.	8	Cagliari, Limited	20	25—27*	+1	5 18 4
550,000	Stck.	16 Apr.	13⅜	Commercial, Old Stock	100	252—257	..	5 7 0
130,000	,,	,,	10⅜	Do. New do.	100	200—205	..	5 4 10
130,000	,,	27 June	4½	Do. 4½ p. c. Deb. do.	100	117—122	..	5 13 9
557,320	20	13 June	13	Continental Union, Limited	20	47—49	..	5 6 2
242,680	20	,,	13	Do. New '69 & '72	14	33—35	..	5 4 0
200,000	20	,,	10	Do. 7 p. c. Pref.	20	38—40	..	5 0 0
75,000	Stck.	28 Mar.	10	Crystal Palace District	100	195—205	..	4 17 7
234,060	10	16 July	—	European, Limited	10	18—20	..	—†
120,000	10	,,	—	Do. New	7½	—	..	—†
354,060	10	,,	—	Do. do.	5	—	..	—†
3,470,620	Stck.	14 Aug.	13	Gaslight & Coke, A, Ordinary	100	235-240*	+½	5 8 4
100,000	,,	,,	4	Do. B, 4 p. c. max.	100	98—101*	..	3 19 3
665,000	,,	,,	10	Do. C, D, & E, 10 p.c. Pf.	100	250-255*	..	3 18 5
30,000	,,	,,	5	Do. F, 5 p. c. Prf.	100	119-123*	..	4 1 3
60,000	,,	,,	7½	Do. G, 7½ p. c. do.	100	177-182*	..	4 2 5
1,300,000	,,	,,	7	Do. H, 7 p. c. max.	100	161-166*	..	4 4 4
463,000	,,	,,	10	Do. J, 10 p. c. Prf.	100	250-255*	..	3 18 5
1,061,150	,,	13 June	4	Do. 4 p. c. Deb. Stk.	100	115—120	..	3 6 8
294,850	,,	,,	4½	Do. 4½ p. c. do.	100	123—128	..	3 10 4
650,000	,,	,,	6	Do. 6 p. c. do.	100	163—168	..	3 11 5
3,800,000	Stck.	15 May	12	Imperial Continental	100	217—221	+1	5 8 7
75,000	5	13 June	6	Malta & Mediterranean, Ltd.	5	5—5⅛	..	5 9 1
560,000	100	1 Apr.	5	Met. of Melbourne, 5 p. c. Deb.	100	112—114	..	4 7 9
541,920	20	13 June	6½	Monte Video, Limited	20	19—20	..	6 10 0
150,000	5	30 May	10	Oriental, Limited	5	8⅞—9⅛	+⅛	5 8 1
60,000	5	28 Mar.	7	Ottoman, Limited	5	5⅛—6	..	5 16 8
166,870	10	16 July	4	Pará Limited	10	3⅛—4⅛	..	3 17 9
420,000	100	2 May	6	People's Gas of Chicago— 1st Mtg. Bds.	100	98—102	..	5 17 8
500,000	100	2 Dec.	6	2nd Do.	100	95—100	..	6 0 0
150,000	10	16 Apr.	10	San Paulo, Limited	10	14—15	..	5 13 4
500,000	Stck.	27 Feb.	13⅛	South Metropolitan, A Stock	100	287—292	−1	4 10 9
1,350,000	,,	,,	11½	Do. B do.	100	231—236	−2	4 17 5
141,500	,,	,,	12	Do. C do.	100	240—250	−4½	4 16 0
650,000	,,	27 June	5	Do. 5 p. c. Deb. Stk.	100	140—145	..	3 9 0
60,000	5	27 Feb.	11⅛	Tottenham & Edm'nton, Orig.	5	11—13	..	4 8 5
				WATER COMPANIES.				
728,446	Stck.	13 June	9½	Chelsea, Ordinary	100	267—272	+2	3 9 10
1,720,560	Stck.	16 Apr.	7½	East London, Ordinary	100	212—216	..	3 9 5
544,440	,,	27 June	4½	Do. 4½ p. c. Deb. Stk.	100	142—147	..	3 1 2
700,000	50	13 June	9	Grand Junction	50	121—125	..	3 12 0
708,000	Stck.	14 Aug.	10½	Kent	100	270-275†	−2½	3 16 4
1,043,800	100	27 June	9½	Lambeth, 10 p. c. max.	100	250—255	..	3 14 6
406,200	100	,,	7½	Do. 7½ p. c. max.	100	197—202	..	3 14 3
200,000	Stck.	28 Mar.	4	Do. 4 p. c. Deb. Stk.	100	122—126	..	3 3 6
500,000	100	14 Aug.	12½	New River, New Shares	100	361-366*	..	3 6 3
1,000,000	Stck.	31 July	4	Do. 4 p. c. Deb. Stk	100	125—128	..	3 2 6
902,300	Stck.	13 June	6	S'thwk & V'xhall, 10 p. c. max.	100	170—174	..	3 9 0
126,500	100	,,	6	Do. 7½ p. c. do.	100	158—163	..	3 13 7
1,155,066	Stck	13 June	10	West Middlesex	100	265—270	..	3 14 1

*Ex.div.

† New reconstruction of capital affords no data at present.

GWYNNE & BEALE'S PATENT GAS EXHAUSTERS AND ENGINES.

Telegrams: "GWYNNEGRAM LONDON." TELEPHONE No. 2698.

GWYNNE & CO.,

HYDRAULIC AND GAS ENGINEERS,

ESSEX STREET WORKS, VICTORIA EMBANKMENT, LONDON, W.C.

Thirty-three Medals at all the Great International Exhibitions have been awarded to GWYNNE & Co. for Gas Exhausters, &c.

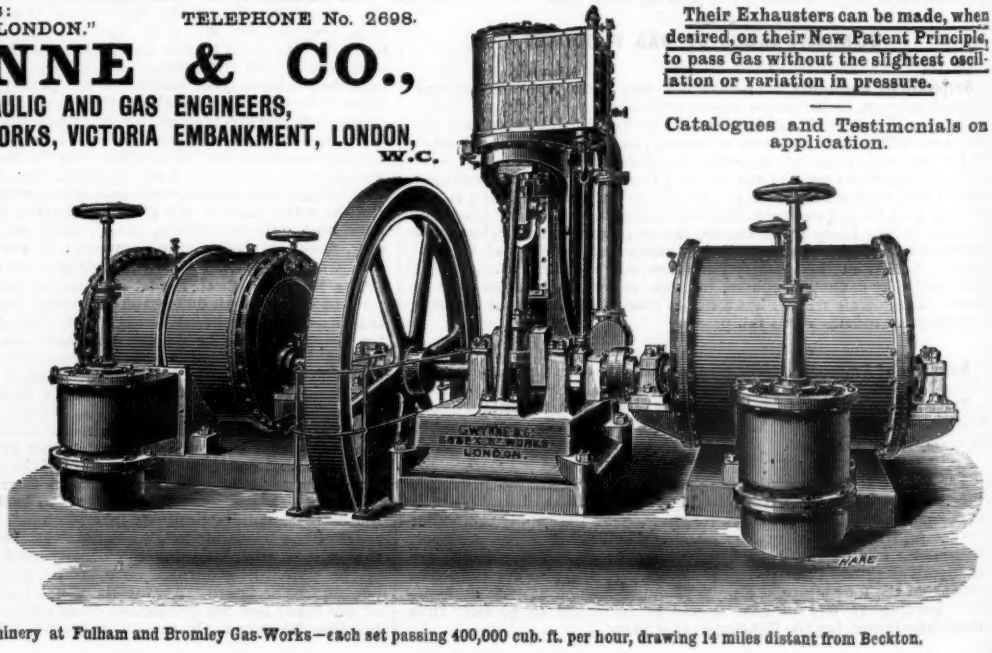
They have completed Exhausters to the extent of 29,000,000 cubic feet passed per hour, which are giving unqualified satisfaction in work.

Makers of GAS-VALVES, HYDRAULIC REGULATORS, VACUUM GOVERNORS, STEAM-PUMPS for Tar, Liquor, or Water; CENTRIFUGAL PUMPS and PUMPING ENGINES, specially adapted for Water-Works, raising Sewage, &c.

Also GIRARD and other TURBINES, HIGH-SPEED ENGINES, DYNAMOS, &c., &c., for ELECTRIC LIGHTING.

Their Exhausters can be made, when desired, on their New Patent Principle, to pass Gas without the slightest oscillation or variation in pressure.

Catalogues and Testimonials on application.



Exhausting Machinery at Fulham and Bromley Gas-Works—each set passing 400,000 cub. ft. per hour, drawing 14 miles distant from Beckton.

NOTICE TO ADVERTISERS.—COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office *not later* than TWELVE O'CLOCK NOON ON MONDAY, to ensure insertion in the following day's issue.

Orders for Alterations in, or Stoppages of PERMANENT ADVERTISEMENTS should be received not later than the FIRST POST on SATURDAYS.

OXIDE OF IRON.

O'NEILL'S Oxide has a larger annual sale in the United Kingdom than all other Oxides combined. Purity and uniformity of quality guaranteed. Pamphlet, "How to Purchase Bog Ore," to be obtained on application.
Gas Purification and Chemical Company, Limited, Palmerston Buildings, Old Broad Street, London, E.C.
JOHN WM. O'NEILL, Managing Director.

CANNEL COAL, ETC.

JOHN ROMANS & SON, EDINBURGH. Gas Engineers, supply all the most approved SCOTTISH CANNELS; also FIRE-CLAY GOODS, CAST-IRON PIPES, and other APPARATUS for GAS AND WATER WORKS.
Prices, &c., will be forwarded on application to No. 20, ST. ANDREW SQUARE, EDINBURGH, / NEWTON GRANGE, NEAR DALKEITH, } SCOTLAND.

SULPHURIC ACID, B.O.V., for Sulphate of Ammonia Making. Guaranteed clear, of full strength, and to produce a fine white-coloured salt, Delivered in carboys or railway tank waggons.
For prices and terms address BALE, BAKER, AND CO., 120 & 121, Newgate Street, LONDON.

EXTRACT from the Harrogate Gas Company's Report, dated the 5th of February, 1890: Coal consumed, 8600 tons. Gas made, 92,880,000 feet; ditto sold, 84,880,000 feet; ditto unaccounted for, 8,000,000 feet; quantity made per ton, 10,800 feet; ditto sold, 9869 feet. Illuminating Power, 16·1 candles. Coals used, Brancepeth. Owners, Strakers and Love, Newcastle-on-Tyne; who have also Brandon Hutton Seam Unscreened Gas Coal. Analysis, 10,500 cubic feet per ton; Illuminating Power, 16·2 candles.

ADVERTISER (aged 32) desires an appointment as MANAGER of medium-sized Works, Assistant of large, or Superintendent of Distribution Department. Well up in the Manufacture, Purification, and Distribution of Gas, and a practical acquaintance with all modern Gas Apparatus, both for Lighting and Heating. Fair Chemist. Highest references.
Address No. 1850, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by the Advertiser, a Situa- tion as GAS-FITTER, MAIN and SERVICE LAYER, METER READER, &c. Would be willing to make himself generally useful on Works. An abstainer.
Apply to T. BARRETT, Gas House Road, NEWBURY.

WANTED, by a competent Man, a Situation as SERVICE LAYER, METER FIXER, INDICE READER, MAIN TESTER, &c. First-class testimonials.
Address A. B., 16, Station Street, STRATFORD, E.

WANTED, by a young Man, Son of a Gas and Water Superintendent, a SITUATION in Gas or Water Works. Has had charge of Main and Service laying. Experience in general outside Works. Age 22. Good reference.
Apply, by letter, to No. 1848, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by an experienced Man, a Situation as MANAGER or FOREMAN. Has had first-class experience in carbonising. Completely understands both the Manufacture and Distribution of Gas; and also the construction of, and general work on a Gas-Works. Antecedents will bear the strictest investigation.
Apply, by letter, to No. 1838, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a steady, sober, intelligent MAN as ENGINE, BOILER, and EXHAUSTER TENDER. He must also be a good Fitter and Mechanic. Preference will be given to one who has been engaged in a Gas-Works at similar Work. Good references required.
Apply to the MANAGER of the Gas-Works, Mitcham, SURREY.

STOKER Wanted, at a small Gas- Works (night duty), and to extinguish Street Lamps in Winter. Arrangements will be made for constant employment.
State wages required, and present or last employment, to the MANAGER of the Gas and Water Works, SWANAGE, DORSET.

CLERK Wanted, to keep the Accounts of a Gas Company in the country. He must be acquainted with Book-keeping by double entry, a neat Writer, and quick at Figures. He must be strictly sober and industrious, with a good character from last situation.
Address, stating salary required, and enclosing copies of testimonials, to AUDITOR, care of Bruce and Ford, Trump Street, LONDON, E.C.

TO BE LET, on Lease or Yearly, a small GAS-WORKS in Lincolnshire, with a Coal Trade attached.
For particulars apply to R. LITTLE, Lessee of Gas-Works, Burgh, LINCOLNSHIRE.

WANTED to Lease, a Gas-Works of any magnitude.
Address No. 1849, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

JAMES LAWRIE & CO. supply Best SCOTCH CANNEL COALS, Best FIRE-CLAY RETORTS, BRICKS, TILES, and LUMPS; BOILER SEATING BLOCKS, FLUE COVERS, and SILICA BRICKS for SPECIAL FURNACE WORK; COKE BARROWS, BOGIES, and SMALL WAGONS.
Postal Address: 1, WHITTINGTON AVENUE, E.C.
Telegram Address: "EIRWAL LONDON."

W. C. HOLMES & Co., Huddersfield, AND 80, CANNON STREET, LONDON,
Contractors for Gas-Works complete, Makers of Gasholders, Purifiers, Scrubbers, Condensers, Retort Fittings, &c., Improved Valves, Engines, and Exhausters. Also for Collingwood's Regenerative Retort-Settings.
*** See Advertisement p. 884 of this week's issue.
Cablegrams: "Ignitor London." Telegrams: "Holmes Huddersfield."

J. & J. BRADDOCK, Globe Meter Works, Oldham.
First-Class Award, Melbourne Exhibition, 1880, for Wet and Dry Gas-Meters, Station Meters, and Governors, Pressure-Gauges, Street Lamps, and Pillars, &c.
Telegraphic Address: "Braddock, Oldham."

HUTCHINSON BROTHERS, Barnsley, Gas Engineers and Contractors, Makers of Wet and Dry Gas-Meters and General Gas Apparatus, Sulphate of Ammonia Plant, Lead Saturators, Tanks, &c. Tools and Sundries.

SULPHURIC ACID delivered in Manu- facturers' Tanks or Carboys.
Prices on application to HARDMAN and Co., Miles Platting, MANCHESTER.

WANTED, to purchase Gas Carbon, delivered at nearest Station to Gas-Works, in quantities of not less than 4 tons.
Address, stating price per ton and quantity, No. 1706, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

SMALL GASHOLDER AND TANK.

WANTED, a Second-hand Gasholder and FITTINGS, with or without Tank. Must be in good condition. Price moderate. Capacity about 5000 cubic feet.
Apply to the GAS COMPANY, Hadham, HERTS.

THE Hornsey Gas Company have for SALE Two Cast-Iron TOWER SCRUBBERS—one 7 ft. 6 in. diameter by 30 feet high, and the other 10 feet diameter by 40 feet high—in good condition.
Full particulars can be obtained at the GAS-WORKS, Clarendon Road, HORNSEY, N.

FOR SALE—One 20,000 feet per hour Station Meter in rectangular case, together with Bye-pass and Valves. All in first-class condition. Also four 12 feet square PURIFYING BOXES, with centre valve and connections.
For particulars apply to the undersigned,
ROBERT PORTER,
Secretary and Manager.
Gas-Works, Elland,
Aug. 1, 1890.

FOR SALE—One Single Gasholder, 80 feet diameter by 20 feet deep, ten Cast-Iron Columns and Wrought-Iron Girders.
Also four PURIFIERS in a group, 16 ft. by 12 ft. by 3 ft. 9 in. deep; 12-inch Centre-Valve and Connections.
Would erect the above, and make practically equal to new.
Inquiries invited for various second-hand Gas Plant—Gasholders, Tanks, Purifiers, Washers, Exhausters, Station Meters, &c.
Apply to SAML. WHILE (late Ashmore and While), 60, Queen Victoria Street, LONDON, E.C.

ROCHESTER, CHATHAM, AND STROOD GAS-LIGHT COMPANY.

SUPPLY OF COAL.

THE Directors of the above Company invite TENDERS for the supply of 29,000 tons of GAS COAL, to be delivered between the 16th of September prox. and the 30th of June, 1891.
Particulars and form of contract may be had on application to
WILLIAM SYMS,
Secretary and Manager.
Gas Office: 58, High Street,
Rochester, Aug. 9, 1890.

WEST MALLING GAS COMPANY.

TENDERS FOR GAS COAL.

TENDERS are invited for the supply of about 550 tons, more or less, of PELTON MAIN, or any other class of really good GAS COAL, to be delivered at the Company's Works, West Malling, between the 29th day of September, 1890, and the 29th day of September, 1891, in quantities of not more than 50 tons a month.
The name and quality of the coal to be specified in the tender.
Terms: Payments quarterly.
Sealed tenders, addressed "Tenders for Coal," to be forwarded to the Secretary by the 16th of September next.
The Directors do not pledge themselves to accept the lowest or any tender.
By order,
HENRY D. WILDES Secretary.
West Malling, Aug. 16, 1890.

IRISH BOG ORE OXIDE OF IRON.

GAS PURIFICATION.

BALE, BAKER, & CO., direct Importers from Ireland. Sample and Price on application. Spent Oxide and Sulphate of Ammonia purchased.
120 and 121, NEWGATE STREET, LONDON, E.C.

SULPHURIC ACID.

JOHN NICHOLSON & SONS, Chemical Works, LEEDS, specially produce this ACID from BRIMSTONE, for making SULPHATE OF AMMONIA of high quality and good colour. Delivery in our own Railway Tank-Wagons or Carboys. Highest references and all particulars supplied on application.

TUBES.

FOR Gas, Steam, and Water; Galvanized, White Enamelled, and Hydraulic Tubes, &c.
JOHN SPENCER, Globe Tube Works, WEDNESBURY, and 14, Great St. Thomas Apostle, LONDON.

COZE'S Automatic Apparatus for CHARGING AND DISCHARGING GAS-RETORTS. For Illustrated Advertisement of this System, see p. 420.
Inquiries should be addressed to THE AUTOMATIC COAL-GAS COMPANY, LIMITED, 86-88A, LEADENHALL STREET, E.C.

BENTLEY & CO.

MANCHESTER ELECTRICAL STORES.

FOR Batteries, Bells, Wires, and Special Electrical Apparatus, address the best house 17, NEWTON STREET, PICCADILLY, MANCHESTER.

TAR and Liquor wanted.
BROTHERTON AND CO., Commercial Buildings, LEEDS.

WANTAGE GAS-WORKS.

THE Commissioners invite Tenders for a supply of about 800 tons of Best Screened GAS COAL, to be delivered free to Wantage Road (G.W.R.) Station in such quantities as required, to the 31st of August, 1891.
Tenders to be sent in not later than Aug. 26, addressed to
GORDON WALKER,
Manager and Secretary.

TO TAR DISTILLERS.

THE Gas Committee of the Corporation of Blackpool are prepared to receive TENDERS for the surplus TAR produced for the next Twelve months from Aug. 1, 1890.
Tenders, endorsed outside, and addressed to the Chairman, must be sent in by the 23rd of August.
Particulars may be had from the undersigned.
JOHN CREW, Gas Engineer.
Corporation Gas-Works, Blackpool.
Aug. 10, 1890.

TO GALVANIZED ROOF CONTRACTORS.

THE Gas Committee of the Corporation of Blackpool are prepared to receive TENDERS for the EXTENSION of the ROOF of their Coal-Shed.
Tenders, endorsed outside, and addressed to the Chairman, must be sent in by the 23rd of August.
Plans and specification may be seen at the Office of the undersigned.
JOHN CREW, Gas Engineer.
Corporation Gas-Works, Blackpool.
Aug. 10, 1890.

THE Sheffield United Gaslight Company are prepared to receive TENDERS for the construction of an IRON ROOF, about 160 feet long by 52 feet wide, to cover a portion of the Coal Sidings at their Neepsend Station.
Forms of tender, with bill of quantities, may be obtained, and the drawings may be seen, on and after Monday, the 25th inst., upon application to the Engineer, at the Company's Offices, Commercial Street, Sheffield, and sealed tenders must be delivered to the undersigned on or before Wednesday, the 3rd day of September next.
The Directors do not bind themselves to accept the lowest or any tender.
HANBURY THOMAS,
General Manager
Aug. 16, 1890.

TO TAR DISTILLERS, ETC.

THE Directors of the Sheffield United Gaslight Company are prepared to receive TENDERS for the purchase of the surplus TAR made at their Neepsend and Effingham Street Works, for the period of Twelve months, ending Aug. 31, 1891.
The quantities will be, approximately: Neepsend, 6500 tons; Effingham Street, 1500 tons.
At Neepsend the Tar will be loaded into Tanks on the Company's Siding, on the Manchester, Sheffield, and Lincolnshire Railway, or into Barrel-Carts on the Works and at Effingham Street into Barrel-Carts only.
Forms of tender and conditions of contract may be obtained from the undersigned, to whom tenders, endorsed "Tender for Tar," must be delivered on or before Wednesday, Sept. 3.
The Directors do not bind themselves to accept the highest or any tender.
HANBURY THOMAS, General Manager.
Commercial Street, Sheffield, Aug. 16, 1890.

GREAT WIGSTON GAS COMPANY.

TO TAR DISTILLERS, ETC.

THE Directors of the above Company invite TENDERS for the surplus TAR produced at their Works for One year, ending Sept. 30, 1891 (coal carbonized about 1600 tons), delivered into Tanks on the Midland Railway, or Boats on the Old Union Canal, at Thilby Bridge.

Offers to be at per ton of 200 gallons.

Payments monthly.

Tenders to be addressed to JOHN A. HARRIS, Manager, by Aug. 31.

GAS TAR.

THE Widnes Local Board invite Tenders for the purchase of about 650 tons of GAS TAR from their Gas-Works, for the Twelve months ending Sept. 30, 1891.

Form of tender and conditions of contract may be obtained from Mr. Carr, Gas-Works, Widnes.

Tenders, endorsed "Tar," to be delivered to the undersigned not later than the 30th inst.

The Board do not bind themselves to accept the highest or any tender.

JAS. T. ALLEN, Clerk.

Town Hall, Widnes,
Aug. 13, 1890.

NEW ROMNEY GASLIGHT AND COKE COMPANY, LIMITED.

THE Directors are prepared to receive TENDERS for about 400 tons of Screened LONDONDERRY, NEW PELTON, PELAW MAIN, or SILKSTONE COAL for Twelve months from the 1st day of September next, in such quantities and at such times as the Directors may think fit.

Price of coal to be given free to New Romney Station; and also price delivered on the Strand at Cuttlestone by ship.

Tenders to be sent in not later than the 10th of September next, marked "Tender for Coal."

WM. ALLEN, Secretary.

Gas-Works, New Romney, Kent.

TENDERS FOR TAR.

THE Directors of the Exeter Gaslight and Coke Company invite TENDERS for their surplus TAR for One year from the 14th day of October next.

Delivery on Company's Works filled into purchaser's tanks.

Payments, cash monthly.

Sealed tenders, endorsed "Tender for Tar," will be received by the undersigned on or before Friday, the 12th day of September next; but the Directors do not bind themselves to accept the highest or any tender.

By order,
W. A. PADFIELD, Secretary and Manager.

Gas Offices: 248, High Street, Exeter,
Aug. 6, 1890.

TO ENGINEERS, IRONFOUNDERS, ETC.

THE Corporation of Birkenhead are prepared to receive TENDERS for the supply and erection of CAST and WROUGHT-IRON FITTINGS required for a New Retort-Bench at their Gas-Works.

Plans and Specifications may be seen and bills of quantities obtained (on deposit of one guinea) at the Office of the Gas Engineer, Mr. T. O. Paterson, C.E., Gas-Works, Thomas Street, between the hours of Ten a.m. and Five p.m.

Tenders, sealed and endorsed "Retort-Fittings," to be sent in to me not later than Five p.m. on Friday, the 29th inst.

The Corporation do not bind themselves to accept the lowest or any tender.

By order,
ALFRED GILL, Town Clerk.

Town Hall, Birkenhead, Aug. 9, 1890.

CLITHEROE CORPORATION GAS-WORKS.

THE Corporation of Clitheroe invite TENDERS for the purchase of the surplus TAR and AMMONIACAL LIQUOR produced at their Gas-Works for One year, from the 1st of September next.

Estimates of quantities and other particulars may be had on application to Mr. Miles, Manager, Gas-Works, Clitheroe.

Tenders are to be sent to the undersigned (at whose Offices conditions of contract may be obtained) not later than the 29th inst.

The Corporation do not bind themselves to accept the highest or any tender.

JOHN EASTHAM, Town Clerk.

Clitheroe, Aug. 12, 1890.

CITY OF BELFAST.

CONTRACT FOR COAL.

THE Gas Committee of the Belfast Corporation invite TENDERS for a supply of 100,000 tons of Best Screened GAS COAL, and 6000 tons of High-Class CANNEL, to be delivered free and trimmed in Barges at Belfast Harbour, between Nov. 1, 1890, and Oct. 31, 1891.

No tender for less than 10,000 tons of Coal will be considered.

Monthly quantities and particulars may be obtained from the Manager of the Gas-Works.

Tenders, endorsed "Tender for Coal," should be delivered in my Office not later than the 2nd of September.

The lowest or any tender not necessarily accepted.

SAMUEL BLACK, Town Clerk.

Town Hall, Belfast, Aug. 14, 1890.

TO TAR DISTILLERS AND OTHERS.

THE Directors of the Gloucester Gaslight Company invite TENDERS for the surplus TAR produced at their Works for One, Two, or Three years, from the 1st day of October next.

The Tar will be delivered into Boats or Barges at the Company's Wharf, on the Gloucester and Berkeley Canal.

Offers to be at per ton of 200 gallons.

Payments, cash monthly.

Further particulars may be obtained on application to Mr. R. Morland, the Company's Engineer.

Sealed tenders, endorsed "Tender for Tar," and addressed to the Chairman, Gas Offices, Quay, Gloucester, to be delivered not later than Tuesday, the 26th day of August inst.

The Directors do not bind themselves to accept the highest or any tender.

By order,
WILLIAM E. VINSON, Secretary.

Gas Offices, Gloucester, Aug. 7, 1890.

TIPTON GAS-WORKS.

COAL CONTRACTS.

THE Gas Committee of the Tipton Local Board invite TENDERS for the supply of GAS COAL, for a period of One, Two, or Three years, from the 1st of September next, in annual quantities of about 9000 tons, to be delivered, carriage free, to the Gas-Works Sidings (London and North-Western Railway).

Specification and form of tender may be obtained at the Gas-Works, on application to Mr. Vincent Hughes, the Engineer and Manager.

Sealed and endorsed tenders to be sent to me, the undersigned, not later than Ten a.m., on Monday, the 25th inst.

The Committee do not bind themselves to accept the lowest or any tender.

By order,
GEO. M. WARING,
Clerk to the Board.

Tipton, Aug. 8, 1890.

HOLMSIDE GAS COALS.

THE Owners of Holmside and South Moor Collieries possess an undivided area of nearly 5000 acres of COAL in the County of Durham, over the greater portion of which area the most of the best Coal of the district, including the well-known Hutton Seam, remains almost untouched; and as preparations are being made for working the Hutton Seam on a large scale, it is expected that the reputation of HOLMSIDE GAS COALS will be still further increased. The Holmside and South Moor Collieries have been in the hands of the same families for over half a century; but, until lately, no adequate attempt has been made to open out their very large Coal-Field, notwithstanding that the best Coal of the district around them, and especially the Hutton Seam, has been for some time past seriously diminished by reason of the vigorous workings of neighbouring coal-owners. Holmside Gas Coals are now being worked out of Holmside and South Moor Collieries at a rate of about 2200 tons per working day—a rate totally inadequate to meet the existing demand. By an extensive development of workings in the Hutton Seam, it is hoped that the demand may be fully met, and the quality raised to the highest point attainable by Durham Coal.

For price and particulars, apply to MARK ARCHER, Holmside and South Moor Offices, Quayside, NEWCASTLE-ON-TYNE.

BROMLEY GAS CONSUMERS' COMPANY.

NOTICE is hereby given that the ORDINARY HALF-YEARLY GENERAL MEETING of this Company will be held at the Bell Hotel, Bromley, Kent, on Thursday, the 28th day of August inst., at Six o'clock precisely, to receive the Report of the Directors, the Balance-Sheet confirmed by the Auditors, to declare a Dividend, and for General Business.

The Transfer Books will be closed from the 15th to the 28th of August, 1890, both days inclusive.

By order of the Board,
HENRY W. AMOS, Secretary.

Offices: At the Works, Bromley,
Kent, Aug. 13, 1890.

BRIGHTON AND HOVE GENERAL GAS COMPANY.

TO THE PROPRIETORS.

NOTICE is hereby given, that the ORDINARY HALF-YEARLY GENERAL MEETING of the Proprietors of this Company will be held at the Company's Offices, No. 5, Great Winchester Street, London, on Friday, Sept. 5, 1890, at Two o'clock in the afternoon precisely, to receive the Report of the Directors and the Accounts of the Company for the Half Year ending the 30th of June, 1890, to declare Dividends, to elect Auditors, and for other purposes.

The Transfer Books of the Company will be closed from the 22nd of August to the 5th of September, both days inclusive.

By order,
W. H. HARDY, F.C.A., Secretary.

Offices: 5, Great Winchester Street,
London, E.C., Aug. 14, 1890.

C. & W. WALKER.

GASHOLDERS; PURIFIERS; PURIFYING MACHINES;

CO_2 AND TAR-EXTRACTING WASHERS; SCRUBBERS;

SULPHATE & SULPHUR PLANT;

RETORT MOUTHPIECES; CONDENSERS;

LIFTING APPARATUS; CENTRE AND FOUR-WAY VALVES;

SLIDE VALVES; TAR BURNERS; &C. &C.

WOOD SIEVES.

ADDRESSES: 8, Finsbury Circus, London, E.C.; Midland Iron-Works, Donnington, near Newport, Shropshire.

"FORTRESS LONDON." "FORTRESS DONNINGTON."—Telegraphic.

COLNEY HATCH GAS COMPANY.

NOTICE is hereby given, that the ORDINARY HALF-YEARLY GENERAL MEETING of the Proprietors of this Company will be held at the Company's Offices, New Southgate, on Thursday, the 4th of September next, at Six o'clock in the evening precisely, to receive the Report of the Directors and the Accounts of the Company for the Half Year ending the 30th of June last, to declare Dividends, and for other purposes.

By order,
W. H. HARDY, F.C.A., Secretary.

Aug. 14, 1890.

TOTTENHAM AND EDMONTON GASLIGHT AND COKE COMPANY.

NOTICE is hereby given that the ANNUAL ORDINARY GENERAL MEETING of the Proprietors in this Company will be held at the Company's Offices, Willoughby Lane, Tottenham, on Saturday, the 30th day of August inst., at Three o'clock in the Afternoon precisely, to receive the Report of the Directors, the Statement of Accounts for the Half Year ended the 30th of June, 1890, to declare Dividends for the same period, for the Election of Two Directors and an Auditor for the ensuing year, and for transacting such other business as the Act of Parliament directs.

The Transfer Books will be closed from the 15th to the 30th day of August, both days inclusive.

By order of the Board,
JAMES RANDALL, Secretary.

Offices of the Company:
Willoughby Lane, Tottenham,
Aug. 15, 1890.

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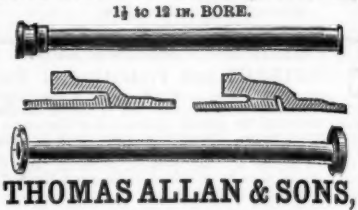

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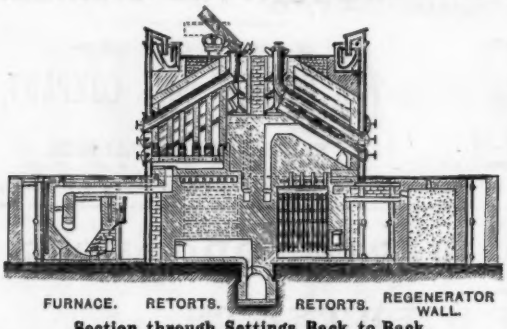
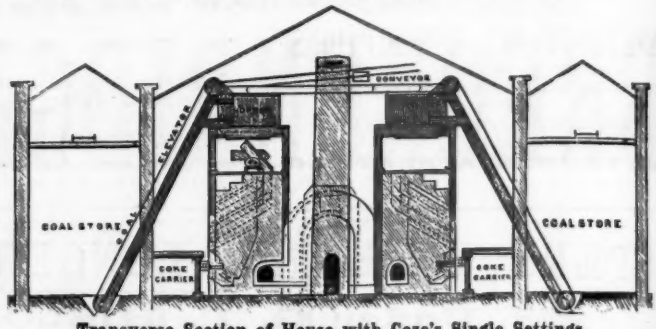


Section through Settings Back to Back.
Working off ground floor with Generator under Stage and Regenerator under the Sets.



Transverse Section of House with Coze's Single Settings,
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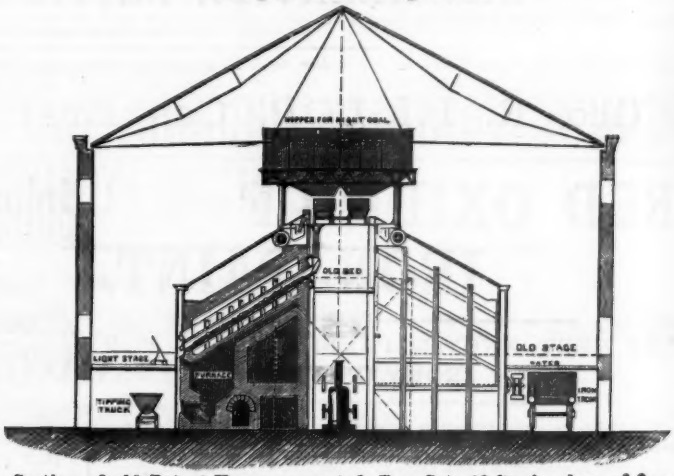
Section through Middle Retort and Furnace.



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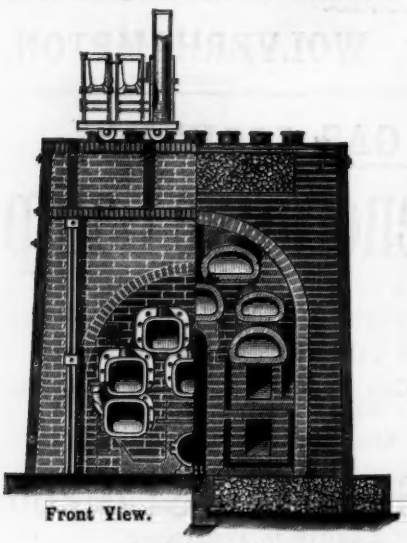
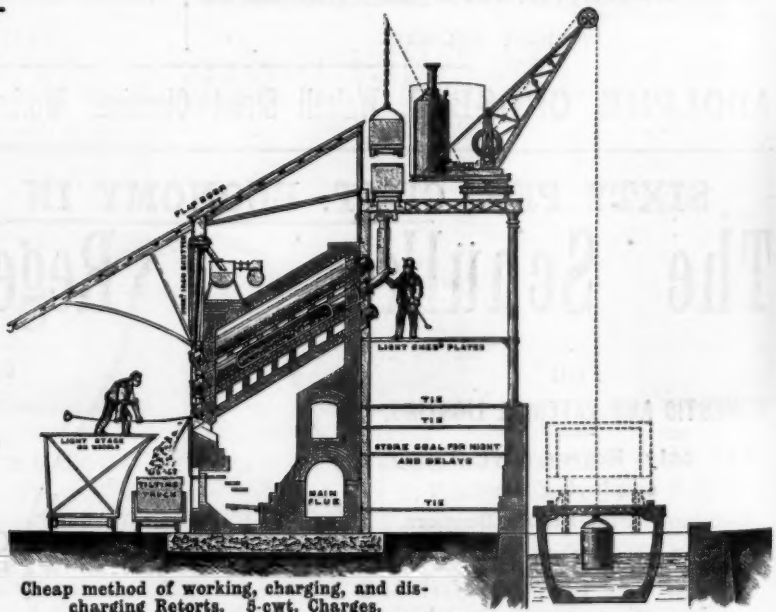


Front View.

Section through Furnace & Bed.



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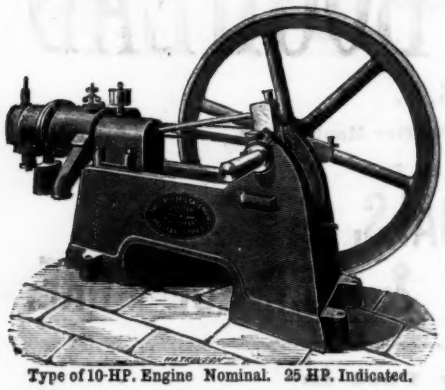

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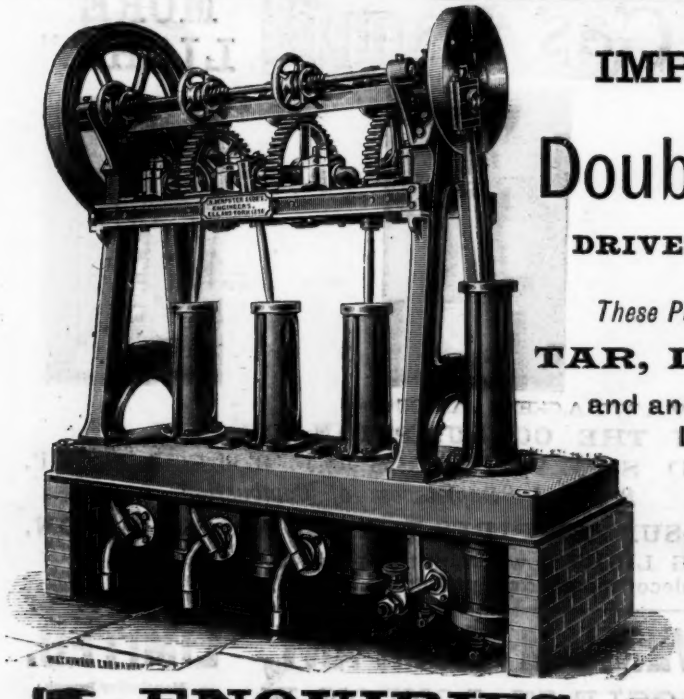

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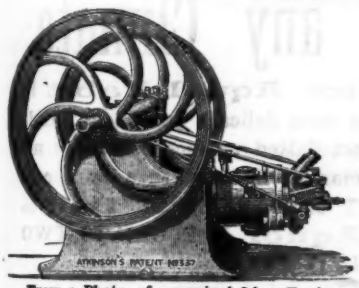

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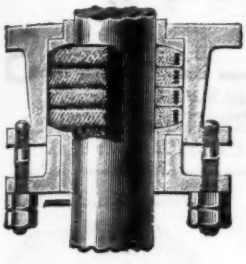

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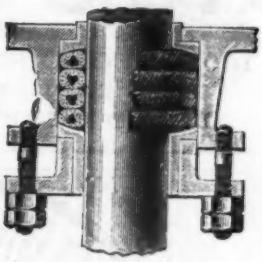

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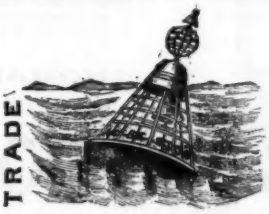

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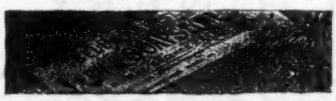

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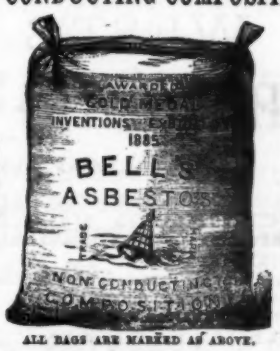

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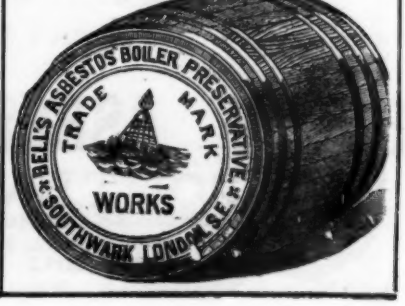

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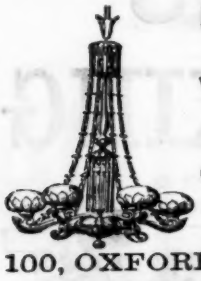

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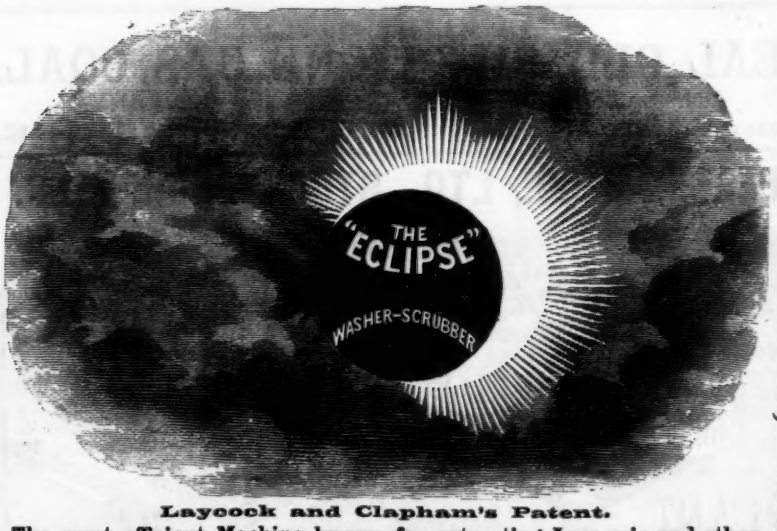

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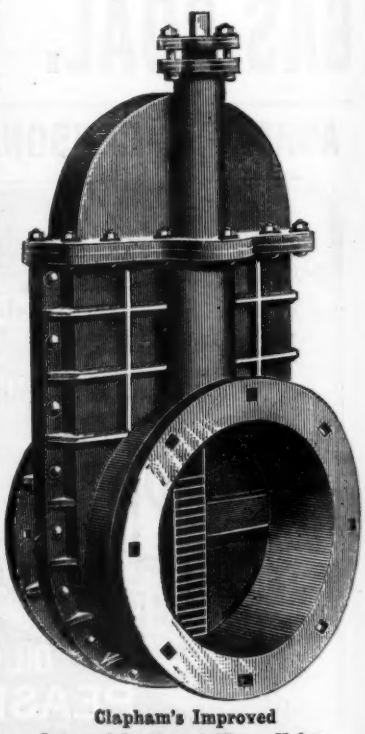

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